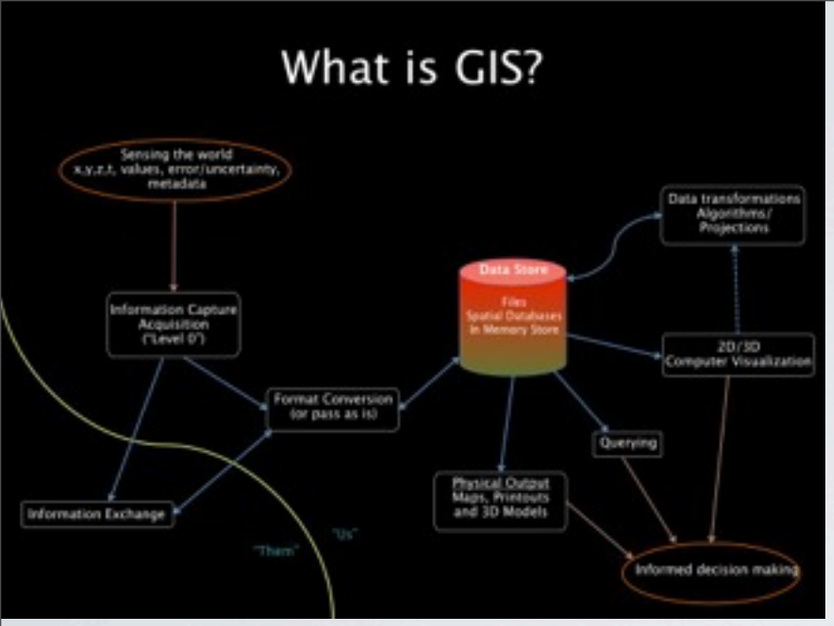

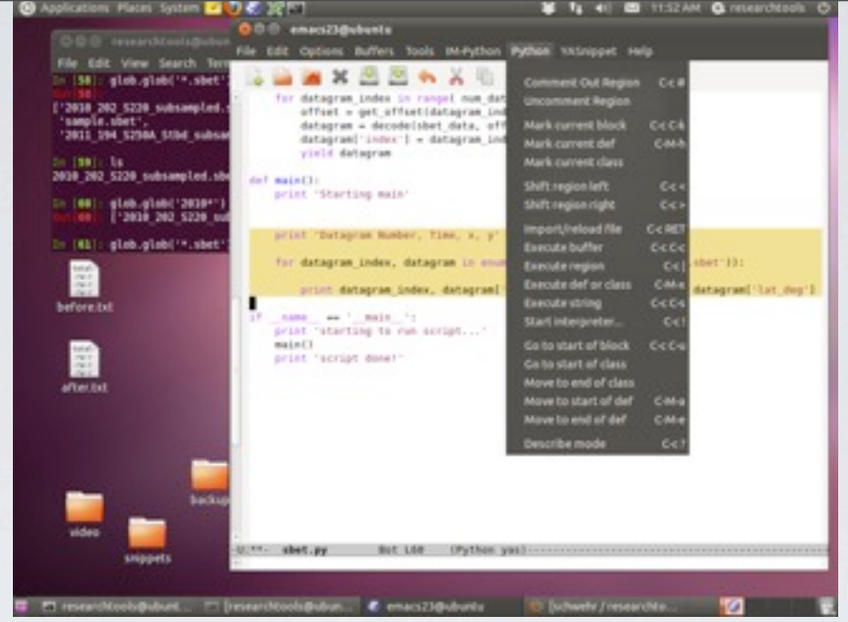

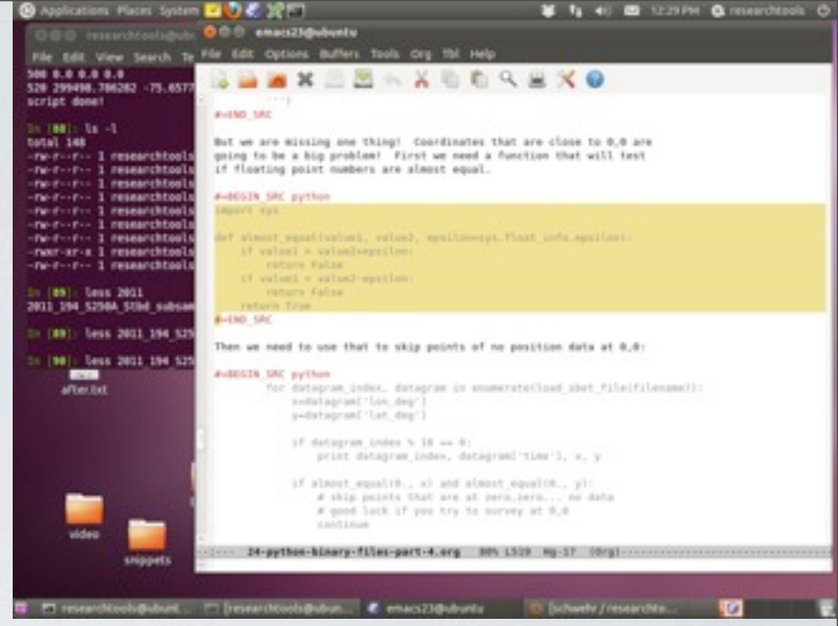

RESEARCH TOOLS 2011
LECTURE 24

2011-Nov-22
Kurt Schwehr
http://schwehr.org

UNH CCOM/JHC
Part 4 - Parsing binary in Python: SBET IMU navigation files

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bitbucket.org https://bitbucket.org/sch Google

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14-python-gps-data.org	4.3 KB	9 days ago	Initial push
15-matplotlib.org	6.3 KB	9 days ago	Initial push
16-matplotlib-2.org	2.0 KB	9 days ago	Initial push
17-qgis-gdal.org	8.8 KB	9 days ago	Initial push
18-bag-hdf-xml.org	8.7 KB	9 days ago	Initial push
19-bag-2-xml-metadata.org	11.7 KB	9 days ago	Initial push
20-bags-3-xml-kml-gshhs.org	12.5 KB	9 days ago	Initial push
21-python-binary-files.org	16.2 KB	7 days ago	removed se
22-python-binary-files-part-2.org	18.2 KB	3 days ago	Cleanup aft
23-python-binary-files-part-3.org	21.4 KB	3 days ago	minor clean
24-python-binary-files-part-4.org	19.4 KB	14 minutes ago	sql writing
Makefile	195 B	2 days ago	Trying to m

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https://bitbucket.org...nary-files-part-4.org

of the GNU/Linux operating system.

ystroke commands
macs features at gnu.org
s manual using Info
mes with *ABSOLUTELY NO WARRANTY*
edistributing and changing Emacs
ted copies of manuals

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nu, GTK+ Version 2.24.4)
bian

Meta-x recover-session RET

-U:%%- *GNU Emacs* All L1 (Fundamental)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:05 AM researchtools

mb

sample.sbet.

projects

video

snippets

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emacs23@ubuntu

File Edit Options Buffers Tools Minibuf Help

```
#+STARTUP: showall

#+TITLE:     Class 24: Python - parsing binary data 2 - SBET IMU dat
#+AUTHOR:    Kurt Schwehr
#+EMAIL:     schwehr@ccom.unh.edu
#+DATE:      <2011-11-15 Tue>
#+DESCRIPTION: Marine Research Data Manipulation and Practices
#+KEYWORDS: struct numpy sbet imu navigation binary hg mercurial ipython
#+LANGUAGE:  en
#+OPTIONS:   H:3 num:nil toc:t \n:nil @:t ::t |:t ^:t -:t f:t *:t <:t
#+OPTIONS:   TeX:t LaTeX:nil skip:t d:nil todo:t pri:nil tags:not-in-toc
#+INFOJS_OPT: view:nil toc:nil ltoc:t mouse:underline buttons:0 path:http://orgmode.org/o
#+LINK_HOME: http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

* COMMENT todo items for Kurt
```

--:--- 24-python-binary-files-part-4.org Top L1 Hg:13 (Org)----------

```
#+INFOJS_OPT: view:nil toc:nil ltoc:t mouse:underline buttons:0 path:http://orgmode.org/o
#+LINK_HOME: http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

* COMMENT todo items for Kurt

- work with multiple sbet files
- reset ipython workspace
- page ipython
- psearch name* type
- ipython bookmark
- filenames = !ls *.bag | sort

* Introduction

Goals
```

--:--- 24-python-binary-files-part-4.org 3% L20 Hg:13 (Org)----------

M-x erc

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [what-is-gis.jpg (JPEG ...

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Applications Places System 11:06 AM researchtools

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projects

video

snippets

researchtools@ubuntu: ~

File Edit View Search Terminal

researchtools@ubuntu:~$

emacs23@ubuntu

File Edit Options Buffers Tools Minibuf Help

```
#+STARTUP: showall

#+TITLE:     Class 24: Python - parsing binary data 2 - SBET IMU dat
#+AUTHOR:    Kurt Schwehr
#+EMAIL:     schwehr@ccom.unh.edu
#+DATE:      <2011-11-15 Tue>
#+DESCRIPTION: Marine Research Data Manipulation and Practices
#+KEYWORDS: struct numpy sbet imu navigation binary hg mercurial ipython
#+LANGUAGE:  en
#+OPTIONS:   H:3 num:nil toc:t \n:nil @:t ::t |:t ^:t -:t f:t *:t <:t
#+OPTIONS:   TeX:t LaTeX:nil skip:t d:nil todo:t pri:nil tags:not-in-toc
#+INFOJS_OPT: view:nil toc:nil ltoc:t mouse:underline buttons:0 path:http://orgmode.org/o
#+LINK_HOME: http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

* COMMENT todo items for Kurt
```

--:--- 24-python-binary-files-part-4.org Top L1 Hg:13 (Org)----------

```
#+INFOJS_OPT: view:nil toc:nil ltoc:t mouse:underline buttons:0 path:http://orgmode.org/o
#+LINK_HOME: http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

* COMMENT todo items for Kurt

- work with multiple sbet files
- reset ipython workspace
- page ipython
- psearch name* type
- ipython bookmark
- filenames = !ls *.bag | sort

* Introduction

Goals
```

--:--- 24-python-binary-files-part-4.org 3% L20 Hg:13 (Org)----------

IRC server: researchtools.ccom.nh

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [what-is-gis.jpg (JPEG ...

Wednesday, November 23, 11

Applications Places System 11:06 AM researchtools

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snippets

researchtools@ubuntu: ~

File Edit View Search Terminal

researchtools@ubuntu:~$

emacs23@ubuntu

File Edit Options Buffers Tools ERC Help

```
#+STARTUP: showall

#+TITLE:     Class 24: Python - parsing binary data 2 - SBET IMU dat
#+AUTHOR:    Kurt Schwehr
#+EMAIL:     schwehr@ccom.unh.edu
#+DATE:      <2011-11-15 Tue>
#+DESCRIPTION: Marine Research Data Manipulation and Practices
#+KEYWORDS: struct numpy sbet imu navigation binary hg mercurial ipython
#+LANGUAGE:  en
#+OPTIONS:   H:3 num:nil toc:t \n:nil @:t ::t |:t ^:t -:t f:t *:t <:t
#+OPTIONS:   TeX:t LaTeX:nil skip:t d:nil todo:t pri:nil tags:not-in-toc
#+INFOJS_OPT: view:nil toc:nil ltoc:t mouse:underline buttons:0 path:http://orgmode.org/o
#+LINK_HOME: http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

* COMMENT todo items for Kurt
```

--:--- 24-python-binary-files-part-4.org Top L1 Hg:13 (Org)----------

kurtvm on irc.debian.org:6667 (+,lag:0)

```
*** - irc.debian.org message of the day
*** - ************************************************
*** - *              H    E    L    L   O             *
*** - *    Welcome on our new IRC server, running on:  *
*** - *    Debian GNU/Linux (www.debian.org)           *
*** - ************************************************
*** End of MOTD command
ERC> /join #unhresearchtools
```

-U:**- Unknown Bot L25 (ERC)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [what-is-gis.jpg (JPEG ...

Applications Places System 11:08 AM researchtools

what-is-gis.jpg (JPEG Image, 1024x768 pixels) - Scaled (72%) - Mozilla Firefox

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vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/w

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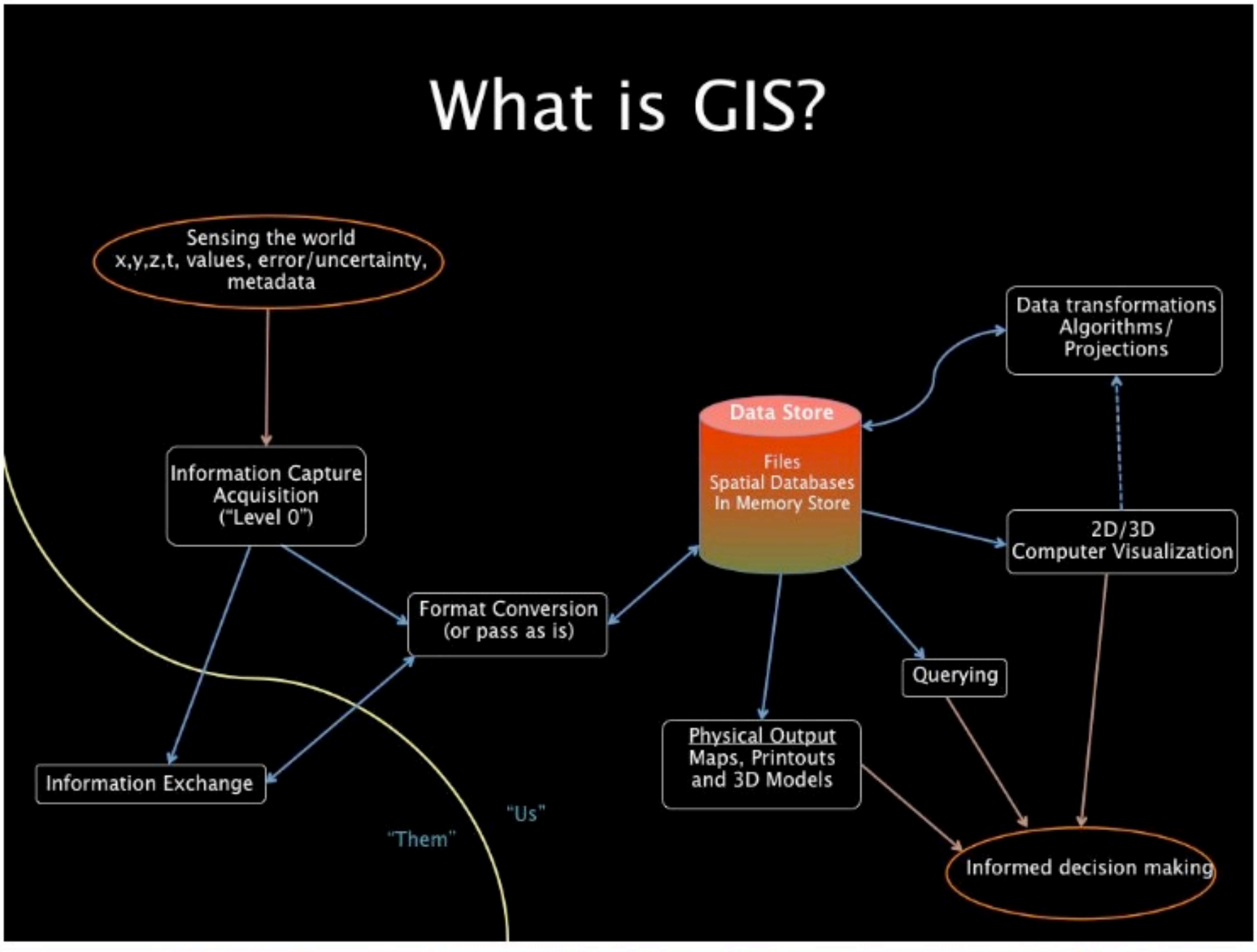
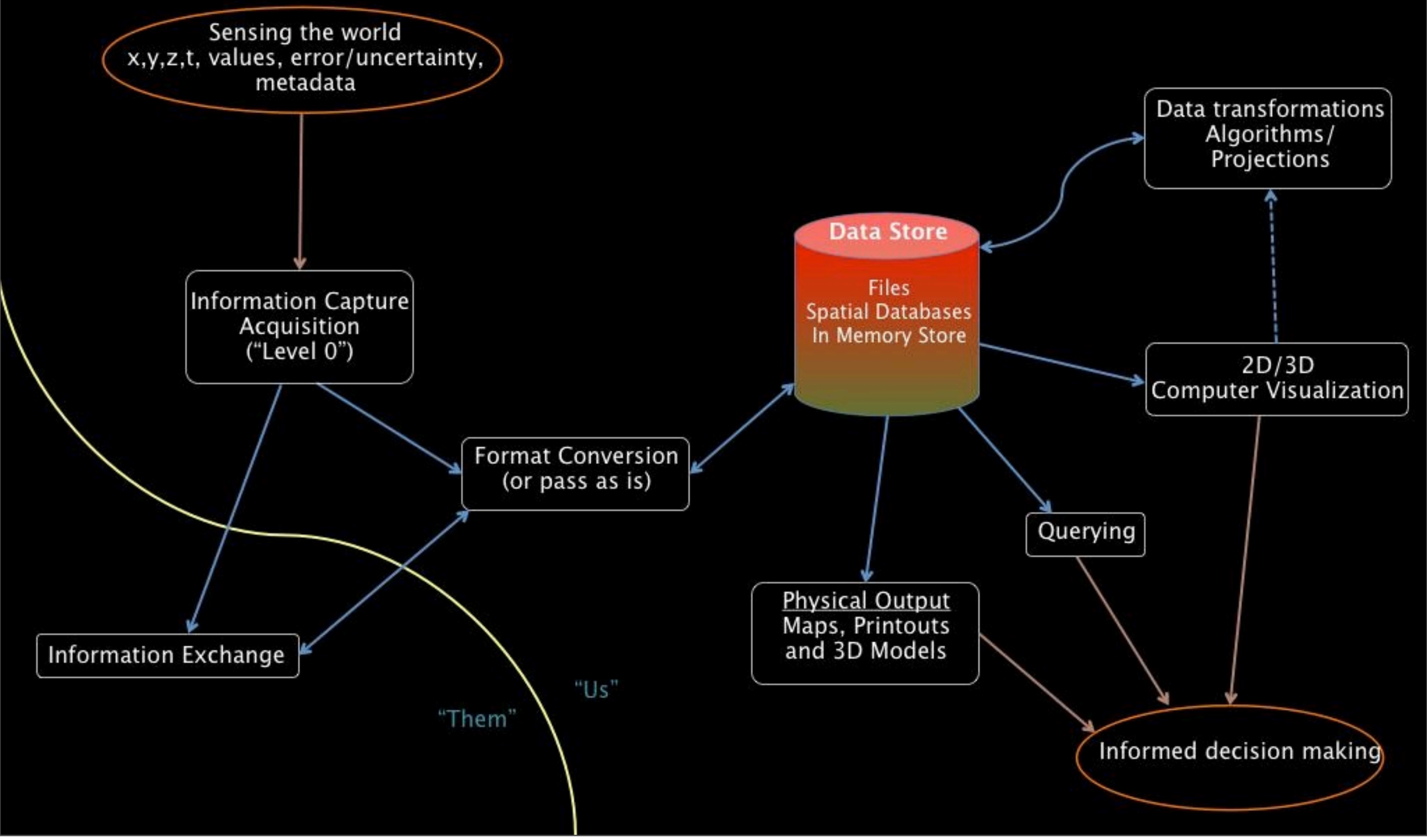


researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu what-is-gis.jpg (JPEG I...

What is GIS?


Sensing the world
x,y,z,t, values, error/uncertainty, metadata
Information Capture
Acquisition
("Level 0")
Data transformations
Algorithms/
Projections
Data Store
Files
Spatial Databases
In Memory Store
2D/3D
Computer Visualization
Format Conversion
(or pass as is)
Querying
Physical Output
Maps, Printouts
and 3D Models
Information Exchange
"Us"
"Them"
Informed decision making

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```
46
47 # [[./figure/what-is-gis
48 [[http://vislab-ccom.unh
49
50 * Setup
51
52 Start emacs
53
54 Open a terminal and star
55
56 In the past, we did the
57
58 #+BEGIN_SRC python
59 # update your mercurial
60 cd ~/projects/researchto
61 bookmark -l
62 bookmark hgclass # Save
63 bookmark -l
64
65 ls > ~/before.txt
66 !hg pull
67 !hg update
68 ls > ~/after.txt
69 !diff --unified ~/before.txt ~/after.txt
70 # You will see nothing if you already updated everything for today's classxs
71
72 mkdir ~/class/24
73 cd ~/class/24
74 bookmark c24
75 bookmark -l
76
77 cd hgclass
78 pwd
79 cd c24
80 pwd
81
```

researchtools@ubuntu: ~

File Edit View Search Terminal Help

```
researchtools@ubuntu:~$ ipython
Python 2.7.1+ (r271:86832, Apr 11 2011, 18:05:24)
Type "copyright", "credits" or "license" for more information.

IPython 0.10.1 -- An enhanced Interactive Python.
?         -> Introduction and overview of IPython's features.
%quickref -> Quick reference.
help      -> Python's own help system.
object?   -> Details about 'object'. ?object also works, ?? prints more.

In [1]: bookmark -l
Current bookmarks:
c24     -> /home/researchtools/class/test-24
hgclass -> /home/researchtools/projects/researchtools/class

In [2]: cd /home/researchtools/projects/researchtools/
/home/researchtools/projects/researchtools

In [3]: ls
class/  dotfiles/  general/  Makefile  video/

In [4]: bookmark hgclass
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

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46
47 # [[./figure/what-is-gis
48 [[http://vislab-ccom.unh
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50 * Setup
51
52 Start emacs
53
54 Open a terminal and star
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64
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66 !hg pull
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73 cd ~/class/24
74 bookmark c24
75 bookmark -l
76
77 cd hgclass
78 pwd
79 cd c24
80 pwd
81
```

researchtools@ubuntu: ~

File Edit View Search Terminal Help

```
In [4]: bookmark hgclass

In [5]: bookmark -l
Current bookmarks:
c24     -> /home/researchtools/class/test-24
hgclass -> /home/researchtools/projects/researchtools

In [6]: ls -l > ~/before.txt

In [7]: less /home/researchtools/before.txt

In [8]: cd class
/home/researchtools/projects/researchtools/class

In [9]: ls -l > ~/before.txt

In [10]: less /home/researchtools/before.txt

In [11]: pwd
Out[11]: '/home/researchtools/projects/researchtools/class'

In [12]:
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

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46
47 # [[./figure/what-is-gis
48 [[http://vislab-ccom.unh
49
50 * Setup
51
52 Start emacs
53
54 Open a terminal and star
55
56 In the past, we did the
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72 mkdir ~/class/24
73 cd ~/class/24
74 bookmark c24
75 bookmark -l
76
77 cd hgclass
78 pwd
79 cd c24
80 pwd
81
```

researchtools@ubuntu: ~

File Edit View Search Terminal Help

```
In [9]: ls -l > ~/before.txt

In [10]: less /home/researchtools/before.txt

In [11]: pwd
Out[11]: '/home/researchtools/projects/researchtools/class'

In [12]: !hg pull
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
pulling from https://bitbucket.org/schwehr/researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
searching for changes
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

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bitbucket.org http

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```
46
47 # [[./figure/what-is-gis
48 [[http://vislab-ccom.unh
49
50 * Setup
51
52 Start emacs
53
54 Open a terminal and star
55
56 In the past, we did the
57
58 #+BEGIN_SRC python
59 # update your mercurial
60 cd ~/projects/researchto
61 bookmark -l
62 bookmark hgclass # Save
63 bookmark -l
64
65 ls > ~/before.txt
66 !hg pull
67 !hg update
68 ls > ~/after.txt
69 !diff --unified ~/before.txt ~/after.txt
70 # You will see nothing if you already updated everything for today's classxs
71
72 mkdir ~/class/24
73 cd ~/class/24
74 bookmark c24
75 bookmark -l
76
77 cd hgclass
78 pwd
79 cd c24
80 pwd
81
```

researchtools@ubuntu: ~

File Edit View Search Terminal Help

```
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
adding changesets
adding manifests
adding file changes
added 3 changesets with 3 changes to 1 files
(run 'hg update' to get a working copy)

In [13]: !hg update
merging class/24-python-binary-files-part-4.org
warning: conflicts during merge.
merging class/24-python-binary-files-part-4.org failed!
0 files updated, 0 files merged, 0 files removed, 1 files unresolved
use 'hg resolve' to retry unresolved file merges

In [14]:
[1]+  Stopped                 ipython
researchtools@ubuntu:~$ cd projects/cl
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

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semester. Covers emacs with

tries to build a Linux and open source software base for students to build on. Please copy, remix and improve this material. License: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

Clone this repository (size: 639.0 KB): **HTTPS** / SSH

$ hg clone https://bitbucket.org/schwehr/researchtools

researchtools / class

Browse at revision

Filename	Size	Date modified	Message
figures			

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
abort: unknown revision '24'!

In [21]:
Do you really want to exit ([y]/n)?
researchtools@ubuntu:~/projects/researchtools/class$ cd ../..
researchtools@ubuntu:~/projects$ rm -rf researchtools/
researchtools@ubuntu:~/projects$ hg clone https://bitbucket.org/schwehr/researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
destination directory: researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
requesting all changes
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
adding changesets
adding manifests
adding file changes
added 18 changesets with 86 changes to 73 files
updating to branch default
73 files updated, 0 files merged, 0 files removed, 0 files unresolved
researchtools@ubuntu:~/projects$
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

Applications Places System 11:24 AM researchtools

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Bitbucket is a code hos

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Course material for the UNH

semester. Covers emacs with org-mode, Bash command line, Python, Proj, GDAL/OGR, QGIS, and much more. It tries to build a Linux and open source software base for students to build on. Please copy, remix and improve this material. License: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

Clone this repository (size: 639.0 KB): **HTTPS** / SSH

```
$ hg clone https://bitbucket.org/schwehr/researchtools
```

researchtools / class

Browse at revision

Filename	Size	Date modified	Message
figures			

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
IPython 0.10.1 -- An enhanced Interactive Python.
?         -> Introduction and overview of IPython's features.
%quickref -> Quick reference.
help      -> Python's own help system.
object?   -> Details about 'object'. ?object also works, ?? prints more.

In [1]: cd cl
class        classmethod

In [1]: cd class
[Errno 2] No such file or directory: 'class'
/home/researchtools/projects/researchtools/class

In [2]: ls
researchtools/

In [3]: ls -l
total 4
drwxr-xr-x 7 researchtools researchtools 4096 2011-11-22 11:24 researchtools/

In [4]: cd
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:26 AM researchtools

mb

projects

dots

sample.sbet.

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```
cd ~/projects/researchtools/class
bookmark -l
bookmark hgclass # Save this for next class
bookmark -l

ls > ~/before.txt
!hg pull
!hg update
ls > ~/after.txt
!diff --unified ~/before.txt ~/after.txt
```

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [5]: cd researchtools/class/
/home/researchtools/projects/researchtools/class

In [6]: pwd
Out[6]: '/home/researchtools/projects/researchtools/class'

In [7]: !hg pull
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
pulling from https://bitbucket.org/schwehr/researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
searching for changes
no changes found

In [8]: !hg update
0 files updated, 0 files merged, 0 files removed, 0 files unresolved

In [9]: ls -l > ~/after.txt

In [10]: !diff  --unified ~/before.txt ~/after.
```

chtools
[11:11]
esearchtools/figures/w
[11:12]
tion
[11:22]

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:28 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
+-rw-r--r-- 1 researchtools researchtools  9023 2011-11-22 11:24 17-qgis-gdal.org
+-rw-r--r-- 1 researchtools researchtools  8863 2011-11-22 11:24 18-bag-hdf-xml.org
+-rw-r--r-- 1 researchtools researchtools 12025 2011-11-22 11:24 19-bag-2-xml-metadata.org
+-rw-r--r-- 1 researchtools researchtools 12847 2011-11-22 11:24 20-bags-3-xml-kml-gshhs.org
+-rw-r--r-- 1 researchtools researchtools 16590 2011-11-22 11:24 21-python-binary-files.org
+-rw-r--r-- 1 researchtools researchtools 18631 2011-11-22 11:24 22-python-binary-files-part-2.o
rg
+-rw-r--r-- 1 researchtools researchtools 21923 2011-11-22 11:24 23-python-binary-files-part-3.o
rg
+-rw-r--r-- 1 researchtools researchtools 19894 2011-11-22 11:24 24-python-binary-files-part-4.o
rg
+drwxr-xr-x 2 researchtools researchtools  4096 2011-11-22 11:24 figures/
+-rw-r--r-- 1 researchtools researchtools   195 2011-11-22 11:24 Makefile

In [11]: !diff  --unified ~/before.txt ~/after.txt
--- /home/researchtools/before.txt      2011-11-22 11:21:40.750654127 -0500
+++ /home/researchtools/after.txt       2011-11-22 11:25:31.703503408 -0500
@@ -1,27 +1,27 @@
 total 340
--rw-r--r-- 1 researchtools researchtools  3572 2011-11-15 11:21 01-introduction.org
--rw-r--r-- 1 researchtools researchtools  6015 2011-11-15 11:21 02-irc-wiki-basic-shell.org
--rw-r--r-- 1 researchtools researchtools 24849 2011-11-15 11:21 03-basic-command-line.org
--rw-r--r-- 1 researchtools researchtools  7952 2011-11-15 11:21 04-ubuntu-virtual-machine.org
--rw-r--r-- 1 researchtools researchtools 24339 2011-11-15 11:21 05-filetypes-emacs.org
--rw-r--r-- 1 researchtools researchtools 11564 2011-11-15 11:21 06-keypassx-dropbox.org
--rw-r--r-- 1 researchtools researchtools 13636 2011-11-15 11:21 07-emacs-and-org-mode.org
--rw-r--r-- 1 researchtools researchtools 10635 2011-11-15 11:21 08-more-emacs-and-script-files.
org
--rw-r--r-- 1 researchtools researchtools  9126 2011-11-15 11:21 09-bash-scripting.org
--rw-r--r-- 1 researchtools researchtools 15081 2011-11-15 11:21 10-qgis-bash-python.org
--rw-r--r-- 1 researchtools researchtools 17642 2011-11-15 11:21 11-ipython.org
--rw-r--r-- 1 researchtools researchtools  9324 2011-11-15 11:21 12-python.org
--rw-r--r-- 1 researchtools researchtools  3530 2011-11-15 11:21 13-python.org
--rw-r--r-- 1 researchtools researchtools  4431 2011-11-15 11:21 14-python-gps-data.org
--rw-r--r-- 1 researchtools researchtools  6408 2011-11-15 11:21 15-matplotlib.org
--rw-r--r-- 1 researchtools researchtools  2032 2011-11-15 11:21 16-matplotlib-2.org
--rw-r--r-- 1 researchtools researchtools  9023 2011-11-15 11:21 17-qgis-gdal.org
```

s classxs

chtools
[11:11]

esearchtools/figures/w

[11:12]

tion
[11:22]

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:29 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [12]: mkdir ~/class/24

In [13]: cd ~/class24
[Errno 2] No such file or directory: '/home/researchtools/class24'
/home/researchtools/projects/researchtools/class

In [14]: cd ~/class/24
/home/researchtools/class/24

In [15]: bookmark c24

In [16]:
```

```
mkdir ~/class/24
cd ~/class/24
bookmark c24
bookmark -l
```

--:--- **24-python-binary-files-part-4.org** 11% L71 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools [11:11]

<hminami> Hi

<matt_w> re is the starting link http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg [11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection [11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------

before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Wednesday, November 23, 11

Applications Places System 11:30 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [16]: bookmark -l
Current bookmarks:
c24     -> /home/researchtools/class/24
hgclass -> /home/researchtools/projects/researchtools

In [17]: pwd
Out[17]: '/home/researchtools/class/24'

In [18]: cd hgclass
(bookmark:hgclass) -> /home/researchtools/projects/researchtools
/home/researchtools/projects/researchtools

In [19]:
```

```
pwd

logstart -o -r log-class-24.py
```

--:--- 24-python-binary-files-part-4.org 12% L81 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools [11:11]

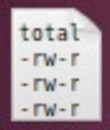
<hminami> Hi

<matt_w> re is the starting link http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg [11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection [11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------



before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Applications Places System 11:31 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [19]: pwd
Out[19]: '/home/researchtools/projects/researchtools'

In [20]: bookmark -l
Current bookmarks:
c24     -> /home/researchtools/class/24
hgclass -> /home/researchtools/projects/researchtools

In [21]: cd c24
(bookmark:c24) -> /home/researchtools/class/24
/home/researchtools/class/24

In [22]:
```

```
pwd

logstart -o -r log-class-24.py
```

--:--- 24-python-binary-files-part-4.org 12% L81 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools [11:11]

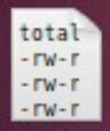
<hminami> Hi

<matt_w> re is the starting link http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg [11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection [11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------



before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Wednesday, November 23, 11

Applications Places System 11:31 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
/home/researchtools/class/24

In [22]: cd hgclass
(bookmark:hgclass) -> /home/researchtools/projects/researchtools
/home/researchtools/projects/researchtools

In [23]: cd class
/home/researchtools/projects/researchtools/class

In [24]: pwd
Out[24]: '/home/researchtools/projects/researchtools/class'

In [25]: bookmark h
```

```
pwd

logstart -o -r log-class-24.py
```

--:--- **24-python-binary-files-part-4.org** 12% L81 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
[11:11]

<hminami> Hi
<matt_w> re is the starting link
http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg
[11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection
[11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------

before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Wednesday, November 23, 11

Applications Places System 11:32 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [25]: bookmark hgclass

In [26]: bookmark -l
Current bookmarks:
c24     -> /home/researchtools/class/24
hgclass -> /home/researchtools/projects/researchtools/class

In [27]: cd c24
(bookmark:c24) -> /home/researchtools/class/24
/home/researchtools/class/24

In [28]:
```

```
pwd

logstart -o -r log-class-24.py
```

--:--- **24-python-binary-files-part-4.org** 12% L81 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools
[11:11]

<hminami> Hi
<matt_w> re is the starting link
http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg
[11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection
[11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------

before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Wednesday, November 23, 11

Applications Places System 11:32 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [28]: pwd
Out[28]: '/home/researchtools/class/24'

In [29]: logstart -o -r log-class-24.py
Activating auto-logging. Current session state plus future input saved.
Filename       : log-class-24.py
Mode           : backup
Output logging : True
Raw input log  : True
Timestamping   : False
State          : active

In [30]:
```

```
pwd

logstart -o -r log-class-24.py
```

--:--- 24-python-binary-files-part-4.org 12% L86 Hg-17 (Org)----------

kurtvm on #unhresearchtools (+,lag:0)

*** hminami (~chatzill@192.168.8.245) has joined channel #unhresearchtools [11:11]

<hminami> Hi

<matt_w> re is the starting link http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/figures/what-is-gis.jpg [11:12]

*** prasadh (~chatzill@lab5.ccom.nh) has quit: Client closed connection [11:22]

ERC>

-U:**- #unhresearchtools@Unknown Bot L34 (ERC)----------

before.txt

after.txt

backup

video

snippets

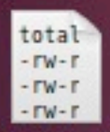
researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [33]: cd 20
[Errno 2] No such file or directory: '20'
/home/researchtools/class/24

In [34]: cd -2
[Errno 2] No such file or directory: '/home/researchtools/examples-20110913'
/home/researchtools/class/24

In [35]: cd -1
/home/researchtools/class/10

In [36]:
```



before.txt

after.txt

backup

video

snippets

```
cd hgclass
pwd
cd c24
pwd

logstart -o -r log-class-24.py

dhist
cd -1
cd -2

alias
alias rtupdate (cd ~/projects/researchtools; hg pull; hg update)
store rtupdate
alias
rtupdate

# Sadly, I don't know how to save an alias in a simple/clean fashion.
# "store" for aliases is broken in ipython 0.11
# http://stackoverflow.com/questions/8183986/saving-ipython-aliases
```

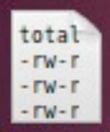
--:--- **24-python-binary-files-part-4.org** 12% L84 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
 '/home/researchtools/projects/researchtools/class',
 '/home/researchtools/class/24',
 '/home/researchtools/projects/researchtools',
 '/home/researchtools/class/24',
 '/home/researchtools/projects/researchtools',
 '/home/researchtools/projects/researchtools/class',
 '/home/researchtools/class/24',
 '/home/researchtools/class/10']

In [37]: _dh[1]
Out[37]: '/home/researchtools/class/10'

In [38]:
```



before.txt

after.txt

backup

video

snippets

```
cd hgclass
pwd
cd c24
pwd

logstart -o -r log-class-24.py

dhist
cd -1
cd -2

alias
alias rtupdate (cd ~/projects/researchtools; hg pull; hg update)
store rtupdate
alias
rtupdate

# Sadly, I don't know how to save an alias in a simple/clean fashion.
# "store" for aliases is broken in ipython 0.11
# http://stackoverflow.com/questions/8183986/saving-ipython-aliases
```

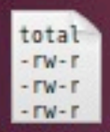
--:--- **24-python-binary-files-part-4.org** 12% L84 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [39]: alias rtupdate (cd /home/researchtools/projects/researchtools/; hg pull; hg update)

In [40]: rtupdate
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
pulling from https://bitbucket.org/schwehr/researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7c:b4:75:ce:9b:6c
:48:94:56:a1:fe not verified (check hostfingerprints or web.cacerts config setting)
searching for changes
no changes found
0 files updated, 0 files merged, 0 files removed, 0 files unresolved

In [41]:
```



before.txt

after.txt

backup

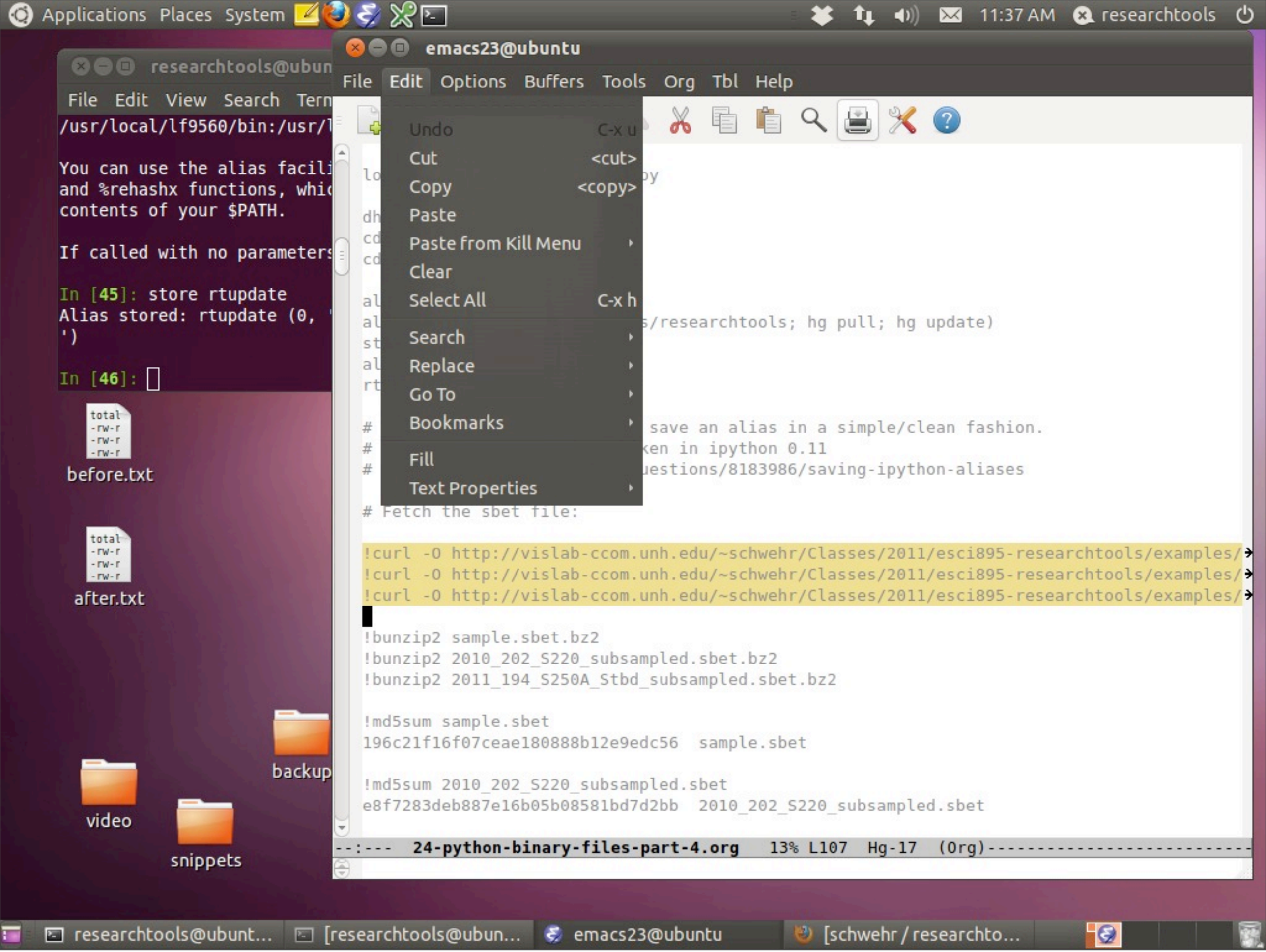
video

snippets

```
cd hgclass
pwd
cd c24
pwd

logstart -o -r log-class-24.py

dhist
cd -1
cd -2

alias
alias rtupdate (cd ~/projects/researchtools; hg pull; hg update)
store rtupdate
alias
rtupdate

# Sadly, I don't know how to save an alias in a simple/clean fashion.
# "store" for aliases is broken in ipython 0.11
# http://stackoverflow.com/questions/8183986/saving-ipython-aliases
```

--:--- **24-python-binary-files-part-4.org** 12% L84 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

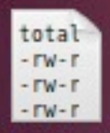

Applications Places System
11:37 AM
researchtools
emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help
Undo C-x u
Cut <cut>
Copy <copy>
Paste
Paste from Kill Menu
Clear
Select All C-x h
Search
Replace
Go To
Bookmarks
Fill
Text Properties
researchtools@ubun
File Edit View Search Term
/usr/local/lf9560/bin:/usr/l
You can use the alias facili
and %rehashx functions, whic
contents of your $PATH.
If called with no parameters
In [45]: store rtupdate
Alias stored: rtupdate (0, '
')
In [46]:
before.txt
after.txt
backup
video
snippets
s/researchtools; hg pull; hg update)
save an alias in a simple/clean fashion.
ken in ipython 0.11
uestions/8183986/saving-ipython-aliases
Fetch the sbet file:
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!bunzip2 sample.sbet.bz2
!bunzip2 2010_202_S220_subsampled.sbet.bz2
!bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2
!md5sum sample.sbet
196c21f16f07ceae180888b12e9edc56 sample.sbet
!md5sum 2010_202_S220_subsampled.sbet
e8f7283deb887e16b05b08581bd7d2bb 2010_202_S220_subsampled.sbet
--:--- 24-python-binary-files-part-4.org 13% L107 Hg-17 (Org)
researchtools@ubunt...
[researchtools@ubun...
emacs23@ubuntu
[schwehr / researchto...

Applications Places System 11:37 AM researchtools

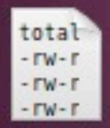
researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
                                 Dload  Upload   Total   Spent    Left  Speed
100 35398  100 35398    0     0  1531k      0 --:--:-- --:--:-- --:--:-- 3142k

In [49]: ls -l
total 76
-rw-r--r-- 1 researchtools researchtools  9779 2011-11-22 11:37 2010_202_S220_subsampled.sbet.bz
2
-rw-r--r-- 1 researchtools researchtools 35398 2011-11-22 11:37 2011_194_S250A_Stbd_subsampled.s
bet.bz2
-rw-r--r-- 1 researchtools researchtools  3439 2011-11-22 11:37 log-class-24.py
-rw-r--r-- 1 researchtools researchtools 22473 2011-11-22 11:37 sample.sbet.bz2

In [50]:
```



before.txt



after.txt

backup

video

snippets

```
# Sadly, I don't know how to save an alias in a simple/clean fashion.
# "store" for aliases is broken in ipython 0.11
# http://stackoverflow.com/questions/8183986/saving-ipython-aliases

# Fetch the sbet file:

!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/

!bunzip2 sample.sbet.bz2
!bunzip2 2010_202_S220_subsampled.sbet.bz2
!bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2

!md5sum sample.sbet
196c21f16f07ceae180888b12e9edc56  sample.sbet

!md5sum 2010_202_S220_subsampled.sbet
e8f7283deb887e16b05b08581bd7d2bb  2010_202_S220_subsampled.sbet
```

--:--- **24-python-binary-files-part-4.org** 13% L107 Hg-17 (Org)----------

menu-bar edit copy

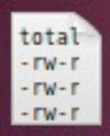
researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 11:37 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [52]: !bunzip2 2010_202_S220_subsampled.sbet.bz2

In [53]: !bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools researchtools  9656 2011-11-22 11:37 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-11-22 11:37 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools  3568 2011-11-22 11:37 log-class-24.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-11-22 11:37 sample.sbet

In [55]:
```



before.txt

after.txt

backup

video

snippets

```
# Sadly, I don't know how to save an alias in a simple/clean fashion.
# "store" for aliases is broken in ipython 0.11
# http://stackoverflow.com/questions/8183986/saving-ipython-aliases

# Fetch the sbet file:

!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/
!curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/

!bunzip2 sample.sbet.bz2
!bunzip2 2010_202_S220_subsampled.sbet.bz2
!bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2

!md5sum sample.sbet
196c21f16f07ceae180888b12e9edc56  sample.sbet

!md5sum 2010_202_S220_subsampled.sbet
e8f7283deb887e16b05b08581bd7d2bb  2010_202_S220_subsampled.sbet
```

--:--- **24-python-binary-files-part-4.org** 13% L111 Hg-17 (Org)----------

menu-bar edit copy

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

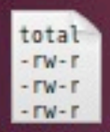
Wednesday, November 23, 11

Applications Places System 11:38 AM researchtools

researchtools@ubun

File Edit View Search Tern

```
In [52]: !bunzip2 2010_202_S

In [53]: !bunzip2 2011_194_S

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r

In [55]:
```



before.txt

after.txt

backup

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

~/.bash_aliases file. Add this line:

```
#+BEGIN_SRC sh
# Specific to the research tools class
alias rtupdate='(cd ~/projects/researchtools; hg pull; hg update)'
#+END_SRC

The parentheses "()" around the command create a "scope" in which the
=cd= command lives.  When bash gets to the right hand ")" is will back
out of the researchtools directory and leave you where you started.

These aliases are not active until you create a new terminal or source the
alias file in an existing terminal.

#+BEGIN_SRC sh
alias rtupdate # try to list the alias
# bash: alias: rtupdate: not found
source ~/.bash_aliases
alias rtupdate
# your new alias should show up

# To list all aliases:
alias
#+END_SRC

* Where were we last time?

#+BEGIN_SRC python
#!/usr/bin/env python

'''Decode Applanix POSPac SBET IMU binary files'''

import struct
```

--:--- **24-python-binary-files-part-4.org** 25% L149 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

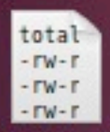
Wednesday, November 23, 11

Applications Places System 11:39 AM researchtools

researchtools@ubun

File Edit View Search Tern

```
In [52]: !bunzip2 2010_202_S

In [53]: !bunzip2 2011_194_S

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r

In [55]:
```



before.txt

after.txt

backup

video

snippets

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File Edit Options Buffers Tools Org Tbl Help

```
alias file in an existing terminal.

#+BEGIN_SRC sh
alias rtupdate # try to list the alias
# bash: alias: rtupdate: not found
source ~/.bash_aliases
alias rtupdate
# your new alias should show up

# To list all aliases:
alias
#+END_SRC

* Where were we last time?

#+BEGIN_SRC python
#!/usr/bin/env python

'''Decode Applanix POSPac SBET IMU binary files'''

import struct
import math
# Use the pprint function from the pprint module
from pprint import pprint

field_names = ('time', 'latitude', 'longitude', 'altitude', \
          'x_vel', 'y_vel', 'z_vel', \
          'roll', 'pitch', 'platform_heading', 'wander_angle', \
          'x_acceleration', 'y_acceleration', 'z_acceleration', \
          'x_angular_rate', 'y_angular_rate', 'z_angular')

datagram_size = 136 # 8*17 bytes per datagram
```

--:--- **24-python-binary-files-part-4.org** 28% L177 Hg-17 (Org)----------

Mark set

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Wednesday, November 23, 11

researchtools@ubun

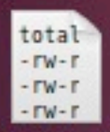
File Edit View Search Tern

```
In [52]: !bunzip2 2010_202_S

In [53]: !bunzip2 2011_194_S

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r

In [55]:
```



before.txt

after.txt

backup

video

snippets

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File Edit Options Buffers Tools Org Tbl Help

```
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)

        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
#+END_SRC

* Command line arguments                                    :commandlineargs:

** TODO fileinput

If we were not working with binary files, we might try the fileinput module.
However, I'll have to leave that for another time.

** searching for files with glob                                    :glob:

If we know something about the names of the files we want to work
with, we can use glob.  Glob gives us bash command line like file name
expansion with "*", "?", and "[0-9]" style expansion.  Try it from
inside of ipython:
```

--:--- **24-python-binary-files-part-4.org** 37% L246 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:39 AM researchtools

researchtools@ubun

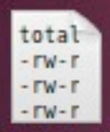
File Edit View Search Tern

```
In [52]: !bunzip2 2010_202_S

In [53]: !bunzip2 2011_194_S

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r

In [55]:
```



before.txt

after.txt

backup

video

snippets

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File Edit Options Buffers Tools Minibuf Help

```
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)

        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
#+END_SRC

* Command line arguments                                    :commandlineargs:

** TODO fileinput

If we were not working with binary files, we might try the fileinput module.
However, I'll have to leave that for another time.

** searching for files with glob                                    :glob:

If we know something about the names of the files we want to work
with, we can use glob.  Glob gives us bash command line like file name
expansion with "*", "?", and "[0-9]" style expansion.  Try it from
inside of ipython:
```

--:--- 24-python-binary-files-part-4.org 37% L246 Hg-17 (Org)----------

Find file: ~/projects/researchtools/class/~/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

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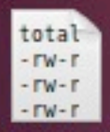
Applications Places System 11:41 AM researchtools

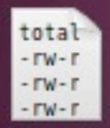
researchtools@ubun

File Edit View Search Tern

```
In [52]: !bunzip2 2010_202_S

In [53]: !bunzip2 2011_194_S

In [54]: ls -l
total 112
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r
-rw-r--r-- 1 researchtools r

In [55]:
```



before.txt



after.txt

backup

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
    return sbet_values

def load_sbet_file(filename):
    '''This is a GENERATOR that we can loop over with a for'''
    sbet_file = open(filename)
    sbet_data = sbet_file.read()

    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)
        datagram['index'] = datagram_index
        yield datagram

def main():
    print 'Starting main'
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)

        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L62 (Python yas)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:43 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
-rw-r--r-- 1 researchtools researchtools 22712 2011-11-22 11:37 sample.sbet

In [55]: run sbet.py
starting to run script...
Starting main
Number of datagrams: 167
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
1 335009.003514 -146.671920256 60.448698066
2 335059.002204 -146.667715067 60.4528836831
3 335109.000894 -146.663165536 60.4570416942
4 335158.999585 -146.659085911 60.4612950577
5 335208.998275 -146.654515522 60.4654683305
```

```
        yield datagram

def main():
    print 'Starting main'
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file('sample.sbet')):

        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L61 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

before.txt

after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:50 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [56]: import glob

In [57]: glob.glob('*.py')
Out[57]: ['log-class-24.py', 'sbet.py']

In [58]: glob.glob('*.sbet')
Out[58]:
['2010_202_S220_subsampled.sbet',
 'sample.sbet',
 '2011_194_S250A_Stbd_subsampled.sbet']

In [59]:
```

```
glob.glob('*.py')
glob.glob('*.sbet')
#+END_SRC
```

--:--- 24-python-binary-files-part-4.org 40% L264 Hg-17 (Org)----------

```
    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)
        datagram['index'] = datagram_index
        yield datagram

def main():
    print 'Starting main'
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file('sample.sbet')):
```

-U:--- sbet.py 66% L53 (Python yas)----------

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

backup

video

snippets

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Wednesday, November 23, 11

Applications Places System 11:51 AM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [58]: glob.glob('*.sbet')
Out[58]:
['2010_202_S220_subsampled.sbet',
 'sample.sbet',
 '2011_194_S250A_Stbd_subsampled.sbet']

In [59]: ls
2010_202_S220_subsampled.sbet  2011_194_S250A_Stbd_subsampled.sbet  log-class-24.py  sample.sbet  sbet.py  sbet.py~

In [60]: glob.glob('2010*')
Out[60]: ['2010_202_S220_subsampled.sbet']

In [61]: glob.glob('*.sbet')
```

```
glob.glob('*.py')
glob.glob('*.sbet')
#+END_SRC
```

--:--- 24-python-binary-files-part-4.org 40% L264 Hg-17 (Org)----------

```
    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)
        datagram['index'] = datagram_index
        yield datagram

def main():
    print 'Starting main'
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file('sample.sbet')):
```

-U:--- sbet.py 66% L53 (Python yas)----------

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

backup

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Wednesday, November 23, 11

Applications Places System 11:51 AM researchtools

researchtools@ubun

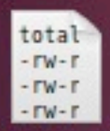
File Edit View Search Tern

```
In [58]: glob.glob('*.sbet')
Out[58]:
['2010_202_S220_subsampled.s
 'sample.sbet',
 '2011_194_S250A_Stbd_subsam

In [59]: ls
2010_202_S220_subsampled.sbe

In [60]: glob.glob('2010*')
Out[60]: ['2010_202_S220_sub

In [61]: glob.glob('*.sbet')
```



before.txt

after.txt

backup

video

snippets

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)
        datagram['index'] = datagram_index
        yield datagram

def main():
    print 'Starting main'
    sbet_file = open('sample.sbet')
    sbet_data = sbet_file.read()

    print 'Number of datagrams:', num_datagrams(sbet_data)

    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file('sample.sbet')):

        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L55 (Python yas)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:52 AM researchtools

researchtools@ubun

File Edit View Search Tern

```
In [58]: glob.glob('*.sbet')
Out[58]:
['2010_202_S220_subsampled.s
 'sample.sbet',
 '2011_194_S250A_Stbd_subsam

In [59]: ls
2010_202_S220_subsampled.sbe

In [60]: glob.glob('2010*')
Out[60]: ['2010_202_S220_sub

In [61]: glob.glob('*.sbet')
```

before.txt

after.txt

backup

video

snippets

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
    for datagram_index in range( num_dat
        offset = get_offset(datagram_ind
        datagram = decode(sbet_data, off
        datagram['index'] = datagram_ind
        yield datagram

def main():
    print 'Starting main'


    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enum                .sbet')):

        print datagram_index, datagram['                datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

Comment Out Region C-c #
Uncomment Region

Mark current block C-c C-k
Mark current def C-M-h
Mark current class

Shift region left C-c <
Shift region right C-c >

Import/reload file C-c RET
Execute buffer C-c C-c
Execute region C-c |
Execute def or class C-M-x
Execute string C-c C-s
Start interpreter... C-c !

Go to start of block C-c C-u
Go to start of class
Move to end of class
Move to start of def C-M-a
Move to end of def C-M-e

Describe mode C-c ?

-U:**- sbet.py Bot L60 (Python yas)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

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Applications Places System 11:53 AM researchtools

researchtools

File Edit View Searc

```
In [58]: glob.glob('*.
Out[58]:
['2010_202_S220_subsam
 'sample.sbet',
 '2011_194_S250A_Stbd_

In [59]: ls
2010_202_S220_subsampl

In [60]: glob.glob('20
Out[60]: ['2010_202_S2

In [61]: glob.glob('*.
```

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
    for datagram_index in range( num_datagrams(sbet_data) ):
        offset = get_offset(datagram_index)
        datagram = decode(sbet_data, offset)
        datagram['index'] = datagram_index
        yield datagram

def main():
    print 'Starting main'

    import glob
    for filename in glob.glob('*.sbet'):
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file('sample.sbet')):

            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:**- **sbet.py** Bot L58 (Python yas)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 11:54 AM researchtools

researchtools

File Edit View Searc

```
In [58]: glob.glob('*.
Out[58]:
['2010_202_S220_subsam
 'sample.sbet',
 '2011_194_S250A_Stbd_

In [59]: ls
2010_202_S220_subsampl

In [60]: glob.glob('20
Out[60]: ['2010_202_S2

In [61]: glob.glob('*.
```

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
def main():
    print 'Starting main'

    import glob
    for filename in glob.glob('*.sbet'):
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L59 (Python yas)----------

Remove the open, read, and print of the number of datagrams lines.

You main function should look like this:

```
#+BEGIN_SRC python
def main():
    print 'Starting main'

    import glob

    for filename in glob.glob('*.sbet'):
        print '====',filename,'====='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
```

--:--- **24-python-binary-files-part-4.org** 44% L285 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
523 299648.790804 -75.6639009625 37.0168205892
524 299698.79231 -75.6659561408 37.0168327333
525 299748.793818 -75.6680082787 37.0168315835
526 299798.795325 -75.6700449864 37.0168226862
527 299848.796832 -75.6720776039 37.0168171781
528 299898.798339 -75.6741238904 37.01684501
529 299948.799847 -75.6761764596 37.0168625336
530 299998.801354 -75.6780952432 37.0165026156
531 300048.802859 -75.679522178 37.0157050267
532 300098.804367 -75.6805835639 37.0164849608
script done!

In [62]: run sbet.py
```

```
def main():
    print 'Starting main'

    import glob
    for filename in glob.glob('*.sbet'):
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L56 (Python yas)----------

```
Remove the open, read, and print of the number of datagrams lines.

You main function should look like this:

#+BEGIN_SRC python
def main():
    print 'Starting main'
```

before.txt

after.txt

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
==== 2011_194_S250A_Stbd_subsampled.sbet ====
Datagram Number, Time, x, y
0 273498.006144 -75.6779674319 36.9993413966
20 275498.065662 -75.6303574293 37.0128677637
40 277498.125213 -75.5375106226 37.013026657
60 279498.184882 -75.544032377 37.0140028866
```

```
def main():
    print 'Starting main'

    import glob
    for filename in glob.glob('*.sbet'):
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L59 (Python yas)----------

Remove the open, read, and print of the number of datagrams lines.

You main function should look like this:

```
#+BEGIN_SRC python
def main():
    print 'Starting main'
```

before.txt

after.txt

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

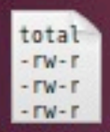
```
In [63]: import sys

In [64]: sys.argv
Out[64]: ['/usr/bin/ipython']

In [65]: print sys.argv
['/usr/bin/ipython']

In [66]: print sys.argv[1:]
[]

In [67]:
```



before.txt

after.txt

video

snippets

```
run sbet
#+END_SRC

** Simple route with sys.argv                                    :sys:

Bet yet, the person using the sbet.py program should be able to
specify which sbet files she wants to use.  We can do this by using
sys.argv.  Check out argv from ipython:

#+BEGIN_SRC python
import sys
print sys.argv

# any file names specified will be after the 1st parameter, which
# is the name of the program.

print sys.argv[1:]
#+END_SRC

Remove the glob code from your main and replace it to use sys.argv.
Your code should look like this:
--:---  24-python-binary-files-part-4.org   45% L299  Hg-17  (Org)----------------------------------
```

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Applications Places System 12:03 PM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [68]: run sbet.py sample.sbet
starting to run script...
Starting main
sys.argv: ['sbet.py', 'sample.sbet']
==== sample.sbet ====
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
20 335958.978642 -146.615374641 60.488061874
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
```

```
    import glob
    import sys

    print 'Starting main'
    print 'sys.argv:',sys.argv

    for filename in sys.argv[1:]:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
]
```

-U:--- **sbet.py** 74% L56 (Python yas)----------

```
Your code should look like this:

#+BEGIN_SRC python
def main():
    print 'Starting main'

    import sys

    for filename in sys.argv[1:]:
        print '====',filename,'===='
```

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:04 PM researchtools

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
In [69]: ls
2010_202_S220_subsampled.sbet  2011_194_S250A_Stbd_subsampled.sbet  log-class-24.py  sample.sbet  sbet.py  sbet.py~

In [70]: run sbet.py sample.sbet 2010_202_S220_subsampled.sbet
starting to run script...
Starting main
sys.argv: ['sbet.py', 'sample.sbet', '2010_202_S220_subsampled.sbet']
==== sample.sbet ====
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
20 335958.978642 -146.615374641 60.488061874
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
```

```
import glob
import sys

print 'Starting main'
print 'sys.argv:',sys.argv

for filename in sys.argv[1:]:
    print '====',filename,'===='
    print 'Datagram Number, Time, x, y'
    for datagram_index, datagram in enumerate(load_sbet_file( filename )):
        if datagram_index % 20 == 0:
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
]
```

-U:--- **sbet.py** 74% L56 (Python yas)----------

Your code should look like this:

```
#+BEGIN_SRC python
def main():
    print 'Starting main'

    import sys

    for filename in sys.argv[1:]:
        print '====',filename,'===='
```

before.txt

after.txt

video

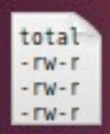
snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
60 315497.935336 -168.502290483 65.5768396777
script done!

In [71]: import argparse

In [72]: parser = argparse.ArgumentParser(description='Parse SBET files')

In [73]: args = parser.parse_args()

In [74]: args
Out[74]: Namespace()

In [75]:
```



before.txt

after.txt

video

snippets

```
    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
#+END_SRC

Now try running it from ipython:

#+BEGIN_SRC python
run sbet.py --help
run sbet.py sample.sbet 2010_202_S220_subsampled.sbet 2011_194_S250A_Stbd_subsampled.sbet
#+END_SRC

We do not need any options right now, but this is a much better way to
--:---  24-python-binary-files-part-4.org   71% L454  Hg-17  (Org)----------
```

Applications Places System 12:11 PM researchtools

researchtools@ubu

File Edit View Search Te

```
   996

/usr/lib/python2.7/argpars
  2325         if message
  2326             self._
-> 2327         _sys.exit(
  2328
  2329     def error(self

SystemExit: 0
Type %exit or %quit to exi

In [76]:
```

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```
def main():
    import glob
    import sys

    print 'Starting main'

    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'
```

-U:**- sbet.py 68% L65 (Python yas)

```
def main():
    print 'Starting main'

    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L459 Hg-17 (Org)

total -rw-r -rw-r -rw-r
before.txt

total -rw-r -rw-r -rw-r
after.txt

video

snippets

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
   2326             self._print_message(message, _sys.stderr)
-> 2327         _sys.exit(status)
   2328
   2329     def error(self, message):

SystemExit: 0
Type %exit or %quit to exit IPython (%Exit or %Quit do so unconditionally).

In [76]: run sbet.py --help
starting to run script...
Starting main
usage: sbet.py [-h] filenames [filenames ...]

Parse SBET files

positional arguments:
  filenames   SBET files

optional arguments:
  -h, --help  show this help message and exit

In [77]:
```

-rw-r

after.txt

video

snippets

```
import sys, argparse

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
args = parser.parse_args() # uses sys.argv

for filename in args.filenames:
    print '====',filename,'===='
    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file(filename)):
        if datagram_index % 10 == 0:
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L459 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

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researchtools@ubuntu: ~/projects

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```
  -h, --help  show this help message and exit

In [77]: run sbet.py
starting to run script...
Starting main
usage: sbet.py [-h] filenames [filenames ...]
sbet.py: error: too few arguments
---------------------------------------------------------------------------
SystemExit                                Traceback (most recent call last)

/home/researchtools/class/24/sbet.py in <module>()
     70 if __name__ == '__main__':
     71     print 'starting to run script...'
---> 72     main()
     73     print 'script done!'
     74

/home/researchtools/class/24/sbet.py in main()
     59     parser = argparse.ArgumentParser(description='Parse SBET files')
     60     parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
---> 61     args = parser.parse_args() # uses sys.argv
     62
```

-rw-r

after.txt

video

snippets

```
import sys, argparse

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
args = parser.parse_args() # uses sys.argv

for filename in args.filenames:
    print '====',filename,'===='
    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file(filename)):
        if datagram_index % 10 == 0:
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L459 Hg-17 (Org)

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:15 PM researchtools

researchtools@ubu

File Edit View Search Te

```
AttributeError: 'Namespace
WARNING: Failure executing


In [80]: run sbet.py sampl
starting to run script...
Starting main
filename: ['sample.sbet']
==== sample.sbet ====
Datagram Number, Time, x,
0 334959.004823 -146.67523
20 335958.978642 -146.6153
40 336958.952453 -146.6020
60 337958.926239 -146.6142
80 338958.900046 -146.6171
100 339958.873884 -146.641
120 340958.847702 -146.639
140 341958.821503 -146.639
160 342958.795311 -146.669
script done!

In [81]:
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
def main():
    import glob
    import sys

    print 'Starting main'

    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    print 'filenames:', args.filenames

    for filename in args.filenames:
```

-U:--- **sbet.py** 67% L63 (Python yas)----------

```
def main():
    print 'Starting main'

    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- **24-python-binary-files-part-4.org** 71% L458 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/projects

File Edit View Search Terminal Help

```
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
script done!

In [81]: run sbet.py sample.sbet 2011_194_S250A_Stbd_subsampled.sbet
starting to run script...
Starting main
filenames: ['sample.sbet', '2011_194_S250A_Stbd_subsampled.sbet']
==== sample.sbet ====
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
20 335958.978642 -146.615374641 60.488061874
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
==== 2011_194_S250A_Stbd_subsampled.sbet ====
Datagram Number, Time, x, y
```

-rw-r

after.txt

```
    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

video

snippets

--:--- 24-python-binary-files-part-4.org 71% L458 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Applications Places System 12:16 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [82]: run sbet.py sample.sbet 2011_194_S250A_Stbd_subsampled.sbet
[1]+  Stopped                 ipython
researchtools@ubuntu:~/projects$ cd ~/class/24
researchtools@ubuntu:~/class/24$ ls -l
total 124
-rw-r--r-- 1 researchtools researchtools  9656 2011-11-22 11:37 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-11-22 11:37 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools  4369 2011-11-22 12:15 log-class-24.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-11-22 11:37 sample.sbet
-rw-r--r-- 1 researchtools researchtools  2322 2011-11-22 12:15 sbet.py
-rw-r--r-- 1 researchtools researchtools  2106 2011-11-22 11:40 sbet.py~
researchtools@ubuntu:~/class/24$ chmod +x sbet.py
researchtools@ubuntu:~/class/24$ ls -l *.py
-rw-r--r-- 1 researchtools researchtools 4369 2011-11-22 12:15 log-class-24.py
-rwxr-xr-x 1 researchtools researchtools 2322 2011-11-22 12:15 sbet.py
researchtools@ubuntu:~/class/24$ ./sbet
```

-rw-r

after.txt

video

snippets

```
import sys, argparse

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
args = parser.parse_args() # uses sys.argv

for filename in args.filenames:
    print '====',filename,'===='
    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file(filename)):
        if datagram_index % 10 == 0:
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L458 Hg-17 (Org)

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
  filenames   SBET files

optional arguments:
  -h, --help  show this help message and exit
researchtools@ubuntu:~/class/24$ ./sbet.py sample.sbet
starting to run script...
Starting main
filenames: ['sample.sbet']
==== sample.sbet ====
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
20 335958.978642 -146.615374641 60.488061874
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
script done!
researchtools@ubuntu:~/class/24$ ./sbet.py *.sbet
```

-rw-r
after.txt

```
    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

video snippets

--:--- 24-python-binary-files-part-4.org 71% L458 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
script done!
researchtools@ubuntu:~/class/24$ ./sbet.py *.sbet
starting to run script...
Starting main
filenames: ['2010_202_S220_subsampled.sbet', '2011_194_S250A_Stbd_subsampled.sbet', 'sample.sbet']
==== 2010_202_S220_subsampled.sbet ====
Datagram Number, Time, x, y
0 309498.001641 -168.105985062 65.5652441157
20 311497.979504 -168.217203577 65.5765027734
40 313497.957407 -168.360572515 65.5768083537
60 315497.935336 -168.502290483 65.5768396777
==== 2011_194_S250A_Stbd_subsampled.sbet ====
Datagram Number, Time, x, y
0 273498.006144 -75.6779674319 36.9993413966
20 275498.065662 -75.6303574293 37.0128677637
40 277498.125213 -75.5375106226 37.013026657
60 279498.184882 -75.544032377 37.0140028866
```

-rw-r

after.txt

video

snippets

```
import sys, argparse

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
args = parser.parse_args() # uses sys.argv

for filename in args.filenames:
    print '====',filename,'===='
    print 'Datagram Number, Time, x, y'

    for datagram_index, datagram in enumerate(load_sbet_file(filename)):
        if datagram_index % 10 == 0:
            print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L458 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Applications Places System 12:18 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577022044 37.0168299723
==== sample.sbet ====
Datagram Number, Time, x, y
0 334959.004823 -146.675232704 60.4443123064
20 335958.978642 -146.615374641 60.488061874
40 336958.952453 -146.602068248 60.4880620038
60 337958.926239 -146.614299722 60.488558233
80 338958.900046 -146.6171884 60.4849670034
100 339958.873884 -146.641052374 60.4777459053
120 340958.847702 -146.639497417 60.4777739654
140 341958.821503 -146.63946463 60.4730424798
160 342958.795311 -146.669429917 60.4556509106
script done!
researchtools@ubuntu:~/class/24$ fg
ipython (wd: ~/projects)
```

-rw-r
after.txt

video

snippets

```
    import sys, argparse

    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    for filename in args.filenames:
        print '====',filename,'===='
        print 'Datagram Number, Time, x, y'

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
```

--:--- 24-python-binary-files-part-4.org 71% L458 Hg-17 (Org)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:21 PM researchtools

researchtools@ubu

File Edit View Search Te

```
340 0.0 0.0 0.0
360 0.0 0.0 0.0
380 0.0 0.0 0.0
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577
script done!

In [83]:

In [84]:

In [85]:

In [86]: pwd
Out[86]: '/home/researchto

In [87]:
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```
    parser = argparse.ArgumentParser(description='Parse SBET files')
    parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
    args = parser.parse_args() # uses sys.argv

    print 'filenames:', args.filenames

    for filename in args.filenames:
        print '====',filename,'===='
        out = open(filename+'.kml', 'w')

        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
]
```

-U:--- **sbet.py** 70% L68 (Python yas)----------

```
* It is time to write out kml files                                    :kml:

Inside of main, we need to create the kml:

#+BEGIN_SRC python
    for filename in args.filenames:
        out = open(filename+'.kml','w')
        out.write('''<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
    <Document>
            <Placemark>
                    <name>{filename}</name>
                    <LineString>
                            <coordinates>
        '''.format(filename=filename) )
```

--:--- **24-python-binary-files-part-4.org** 76% L491 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:24 PM researchtools

researchtools@ubu

File Edit View Search Te

```
340 0.0 0.0 0.0
360 0.0 0.0 0.0
380 0.0 0.0 0.0
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577
script done!

In [83]:

In [84]:

In [85]:

In [86]: pwd
Out[86]: '/home/researchto

In [87]:
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
        '''.format(filename=filename) )

        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
            out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

        out.write('''\t\t\t\t</coordinates>
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')
#+END_SRC

But we are missing one thing!  Coordinates that are close to 0,0 are
--:---  24-python-binary-files-part-4.org   78% L496  Hg-17  (Org)----------
```

```
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
]
            out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

```
-U:---  sbet.py        Bot L83    (Python yas)----------------------------------
Wrote /home/researchtools/class/24/sbet.py
```

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr/researchto...

Applications Places System 12:25 PM researchtools

researchtools@ubu

File Edit View Search Te

```
340 0.0 0.0 0.0
360 0.0 0.0 0.0
380 0.0 0.0 0.0
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577
script done!

In [83]:

In [84]:

In [85]:

In [86]: pwd
Out[86]: '/home/researchto

In [87]:
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
        out = open(filename+'.kml', 'w')
        out.write('''<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
    <Document>
            <Placemark>
                    <name>{filename}</name>
                    <LineString>
                            <coordinates>
        '''.format(filename=filename) )



        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
]
            out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

        out.write('''\t\t\t\t</coordinates>
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')


if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L85 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:25 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
340 0.0 0.0 0.0
360 0.0 0.0 0.0
380 0.0 0.0 0.0
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [83]:

In [84]:

In [85]:

In [86]: pwd
Out[86]: '/home/researchtools/class/24'

In [87]: run sbet.py sample.sbet 2010_202_S220_subsampled.sbet 2011_194_S250A_Stbd_subsampled.sbet
```

-rw-r

after.txt

video

snippets

```
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')


if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- sbet.py Bot L85 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
400 0.0 0.0 0.0
420 0.0 0.0 0.0
440 0.0 0.0 0.0
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [88]: ls -l
total 148
-rw-r--r-- 1 researchtools researchtools  9656 2011-11-22 11:37 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools  2393 2011-11-22 12:25 2010_202_S220_subsampled.sbet.kml
-rw-r--r-- 1 researchtools researchtools 72488 2011-11-22 11:37 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 10612 2011-11-22 12:25 2011_194_S250A_Stbd_subsampled.sbet.kml
-rw-r--r-- 1 researchtools researchtools  4568 2011-11-22 12:25 log-class-24.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-11-22 11:37 sample.sbet
-rw-r--r-- 1 researchtools researchtools  5133 2011-11-22 12:25 sample.sbet.kml
-rwxr-xr-x 1 researchtools researchtools  2874 2011-11-22 12:25 sbet.py*
-rw-r--r-- 1 researchtools researchtools  2106 2011-11-22 11:40 sbet.py~

In [89]:
```

-rw-r

after.txt

video

snippets

```
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')


if __name__ == '__main__':
    print 'starting to run script...'
    main()
    print 'script done!'
```

-U:--- **sbet.py** Bot L85 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

Applications Places System 12:26 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
460 0.0 0.0 0.0
480 0.0 0.0 0.0
500 0.0 0.0 0.0
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [88]: ls -l
total 148
-rw-r--r-- 1 researchtools researchtools  9656 2011-11-22 11:37 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools  2393 2011-11-22 12:25 2010_202_S220_subsampled.sbet.kml
-rw-r--r-- 1 researchtools researchtools 72488 2011-11-22 11:37 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 10612 2011-11-22 12:25 2011_194_S250A_Stbd_subsampled.sbet.kml
-rw-r--r-- 1 researchtools researchtools  4568 2011-11-22 12:25 log-class-24.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-11-22 11:37 sample.sbet
-rw-r--r-- 1 researchtools researchtools  5133 2011-11-22 12:25 sample.sbet.kml
-rwxr-xr-x 1 researchtools researchtools  2874 2011-11-22 12:25 sbet.py*
-rw-r--r-- 1 researchtools researchtools  2106 2011-11-22 11:40 sbet.py~

In [89]: less 2011
2011_194_S250A_Stbd_subsampled.sbet      2011_194_S250A_Stbd_subsampled.sbet.kml

In [89]: less 2011_194_S250A_Stbd_subsampled.sbet.kml
```

-rw-r
after.txt

video

snippets

```
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg'
]
            out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

        out.write('''\t\t\t\t</coordinates>
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')
```

-U:--- sbet.py 57% L77 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Wednesday, November 23, 11

Applications Places System 12:26 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
0.0,0.0
:
```

-rw-r

after.txt

video

snippets

```
        print 'Datagram Number, Time, x, y'
        for datagram_index, datagram in enumerate(load_sbet_file( filename )):
            if datagram_index % 20 == 0:
                print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
]
            out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

        out.write('''\t\t\t\t</coordinates>
\t\t\t</LineString>
\t\t</Placemark>
\t</Document>
</kml>
        ''')
```

-U:--- **sbet.py** 57% L77 (Python yas)----------

Wrote /home/researchtools/class/24/sbet.py

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:29 PM researchtools

researchtools@ubu

File Edit View Search Te

```
500 0.0 0.0 0.0
520 299498.786282 -75.6577
script done!

In [88]: ls -l
total 148
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rw-r--r-- 1 researchtools
-rwxr-xr-x 1 researchtools
-rw-r--r-- 1 researchtools

In [89]: less 2011
2011_194_S250A_Stbd_subsam

In [89]: less 2011_194_S25

In [90]: less 2011_194_S25
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```
        ''')
#+END_SRC

But we are missing one thing!  Coordinates that are close to 0,0 are
going to be a big problem!  First we need a function that will test
if floating point numbers are almost equal.

#+BEGIN_SRC python
import sys

def almost_equal(value1, value2, epsilon=sys.float_info.epsilon):
    if value1 > value2+epsilon:
        return False
    if value1 < value2-epsilon:
        return False
    return True
#+END_SRC

Then we need to use that to skip points of no position data at 0,0:

#+BEGIN_SRC python
        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            x=datagram['lon_deg']
            y=datagram['lat_deg']

            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], x, y

            if almost_equal(0., x) and almost_equal(0., y):
                # skip points that are at zero,zero... no data
                # good luck if you try to survey at 0,0
                continue
```

--:--- 24-python-binary-files-part-4.org 80% L519 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:30 PM researchtools

researchtools@ubuntu: ~/class/24

File Edit View Search Terminal Help

```
In [90]: import sys

In [91]: sys.flo
sys.float_info        sys.float_repr_style

In [91]: sys.float_info.
sys.float_info.__add__             sys.float_info.__le__              sys.float_info.dig
sys.float_info.__class__           sys.float_info.__len__             sys.float_info.epsilon
sys.float_info.__contains__        sys.float_info.__lt__              sys.float_info.mant_dig
sys.float_info.__delattr__         sys.float_info.__mul__             sys.float_info.max
sys.float_info.__doc__             sys.float_info.__ne__              sys.float_info.max_10_exp
sys.float_info.__eq__              sys.float_info.__new__             sys.float_info.max_exp
sys.float_info.__format__          sys.float_info.__reduce__          sys.float_info.min
sys.float_info.__ge__              sys.float_info.__reduce_ex__       sys.float_info.min_10_exp
sys.float_info.__getattribute__    sys.float_info.__repr__            sys.float_info.min_exp
sys.float_info.__getitem__         sys.float_info.__rmul__            sys.float_info.n_fields
sys.float_info.__getslice__        sys.float_info.__setattr__         sys.float_info.n_sequence_fields
sys.float_info.__gt__              sys.float_info.__sizeof__          sys.float_info.n_unnamed_fields
sys.float_info.__hash__            sys.float_info.__str__             sys.float_info.radix
sys.float_info.__init__            sys.float_info.__subclasshook__    sys.float_info.rounds

In [91]: sys.float_info.epsilon
```

-rw-r

after.txt

```
#+BEGIN_SRC python
        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            x=datagram['lon_deg']
            y=datagram['lat_deg']

            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], x, y

            if almost_equal(0., x) and almost_equal(0., y):
                # skip points that are at zero,zero... no data
                # good luck if you try to survey at 0,0
                continue
```

video

snippets

--:--- 24-python-binary-files-part-4.org 80% L513 Hg-17 (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...

Applications Places System 12:31 PM researchtools

researchtools@ubu

File Edit View Search Te

```
sys.float_info        sys.

In [91]: sys.float_info.
sys.float_info.__add__
sys.float_info.__class__
sys.float_info.__contains_
sys.float_info.__delattr__
sys.float_info.__doc__
sys.float_info.__eq__
sys.float_info.__format__
sys.float_info.__ge__
sys.float_info.__getattrib
sys.float_info.__getitem__
sys.float_info.__getslice_
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__

In [91]: sys.float_info.ep
Out[91]: 2.220446049250313

In [92]:
```

-rw-r

after.txt

video

snippets

emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```
    return True
#+END_SRC

Then we need to use that to skip points of no position data at 0,0:

#+BEGIN_SRC python
        for datagram_index, datagram in enumerate(load_sbet_file(filename)):
            x=datagram['lon_deg']
            y=datagram['lat_deg']

            if datagram_index % 10 == 0:
                print datagram_index, datagram['time'], x, y

            if almost_equal(0., x) and almost_equal(0., y):
                # skip points that are at zero,zero... no data
                # good luck if you try to survey at 0,0
                continue

            out.write('{x},{y}\n'.format(x=x,y=y))
#+END_SRC

* Can we make an sqlite database?

Just follow along on this one.  Databases are not unlike spreadsheets,
but much easier to manage huge amounts of information.  There are
tables with data.  We will quick try to write an SQLite database.
Here is the command to create a database:

#+BEGIN_SRC sql
CREATE TABLE IF NOT EXISTS sbet_entry (
       time REAL,
       y REAL,
       x REAL,
```

--:--- **24-python-binary-files-part-4.org** 82% L531 Hg-17 [#] (Org)----------

researchtools@ubunt... [researchtools@ubun... emacs23@ubuntu [schwehr / researchto...