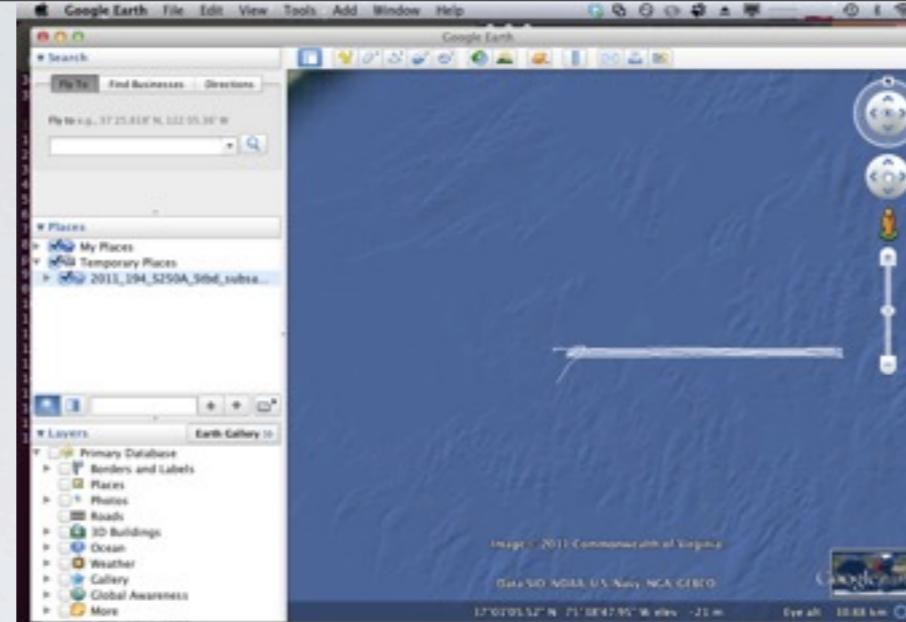


License and specific version	FSP approval	Compatible with GPL	OSI approval	Debian approval	Fedora Project approval
Academic Free License	Yes	No	Yes	?	Yes
Affero GPL version 3	Yes	Yes	Yes	Yes	?
Apache License version 1	Yes	No	Yes	Yes	Yes
Apache License version 1.1	Yes	No	Yes	Yes	Yes
Apache License version 2	Yes	Yes	Yes	Yes	Yes
Apple Public Source License version 1.4	No	No	?	No	No
Apple Public Source License version 2.0	Yes	No	Yes	No	Yes
Artistic License 1.0	No	No	Yes	Yes	No
Classified Artistic License (draft 2.0)	Yes	Yes	Yes	Yes	Yes
Artistic License 2.0	Yes	Yes	Yes	Yes	Yes
Berkeley Database License	Yes	Yes	?	?	?
original BSD license	Yes	No	No	No	Yes



time	x	y	x_vel	y_vel
273498.00614401186	0.6457403284400583	-1.3298297029032352	-46.45023614454548	
273498.00912092274	0.6458430783179088	-1.3297919322130293	-46.74643433925252	
273498.0120963937	0.6459067530324421	-1.3297996018109332	-46.666436689623154	
273498.0150722846	0.645930290668184	-1.3296870294277895	-46.819514601312604	
273498.0180477878	0.6459436114147566	-1.3296725653264602	-46.35614334623393	
273498.02102299067	0.64593559756437566	-1.3296541678776755	-46.47689016454981	
273498.0239991818	0.6459963800701406	-1.329542209362339	-46.75224799663025	
273498.02697517275	0.6460433879478653	-1.32953161107379	-46.56629234302651	
273498.0299505758	0.6460889051875295	-1.329532187988189	-46.68743343158485	
273498.0329267968	0.6460836679115476	-1.3296022811564542	-46.84719842079375	

RESEARCH TOOLS 2011

LECTURE 26

Version control system

Git

Mercurial

Subversion

Source code license

Eclipse Public License 1.0

Select a license...

- Apache License 2.0
- Artistic License/GPL
- Eclipse Public License 1.0
- GNU GPL v2
- GNU GPL v3
- GNU Lesser GPL
- MIT License
- Mozilla Public License 1.1
- New BSD License
- Other Open Source

Project label(s)

2011-Dec-01
Kurt Schwehr

<http://schwehr.org>

UNH CCOM/JHC

Python: writing KML and SQLite



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
c:b4:75:ce:9b:6c:48:94:56:a1:fe not veri
rts config setting)
adding changesets
adding manifests
adding file changes
added 1 changesets with 1 changes to 1 f
(run 'hg update' to get a working copy)
researchtools@ubuntu:~/projects/research
resolving manifests
getting class/26-python-binary-files-par
1 files updated, 0 files merged, 0 files
researchtools@ubuntu:~/projects/research
researchtools@ubuntu:~/project
researchtools@ubuntu:~/class/2
Python 2.7.1+ (r271:86832, Apr
Type "copyright", "credits" or
IPython 0.10.1 -- An enhanced
? -> Introduction and
%quickref -> Quick reference.
help -> Python's own help
object? -> Details about 'ob
In [1]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help
#+STARTUP: showall
#+TITLE:      Class 26: LAST CLASS - Python - binary data 5
#+AUTHOR:    Kurt Schwehr
#+EMAIL:     schwehr@ccom.unh.edu
#+DATE:      <2011-12-01 Thu>
#+DESCRIPTION: Marine Research Data Manipulation and Practices
#+KEYWORDS:  struct numpy sbet imu navigation binary hg mercurial ipython
#+LANGUAGE:  en

```

Research Tools Class 26 - Final Class

Search Link Text Notebook

Research Tools Class 26 - Final Class

Kurt Schwehr
 UNH CCOM/JHC
 2011-Dec-01
<http://schwehr.org>

```

t |:t ^:t -:t f:t *:t <:t
do:t pri:nil tags:not-in-toc
underline buttons:0 path:http://orgm
wehr/Classes/2011/esci895-researchto

```

1. This turned out to be ch Tools at CCOM/JHC. l is dead. Today, in part for data and source code.

```

- Original single document of Python - parsing binary data files
  (points to the most recent version in bitbucket)

* Reminder - class material copying is encouraged

Class materials are copyright by the person creating them, so you are
not free to give class materials to others unless the author gives you
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For these class notes, videos, audio files, and examples, I encourage
----- 26-python-binary-files-part-5.org Top L1 Hg-30 (Org) -----
Mark set

```



Index of /~schw/rt

No.	Date	
28	2011-12-08	No Class
27	2011-12-06	No Class
HW 5	2011-12-06	Turn in final log file
26	2011-12-01	Last Class
25	2011-11-29	Rob Braswell: 1-Intro
Vid 19	2011-11-27	Mercurial (hg) for ver
	2011-11-24	No Class - Thanksgiv
24	2011-11-22	Python: parsing binar
23	2011-11-17	Python: parsing binar
22	2011-11-15	Python: parsing binar
21	2011-11-10	Python: parsing binar
20	2011-11-08	BAGs 3, XML Meta
Vid 18	2011-11-08	Python: Reading a H
Vid 17	2011-11-07	Emacs, HDF5 BAGs
19	2011-11-03	BAGs 2, XML Meta

emacs23@ubuntu

This is the last class of Research Tools 2011. This turned out to be the last time that I will be teaching Research Tools at CCOM/JHC. However, this does not mean that the material is dead. Today, in part of the wrap up, I will talk about copyright for data and source code.

* See Also

- Original single document of [Python - parsing binary data files](#) (points to the most recent version in bitbucket)

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Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

I am very interested in suggestions, corrections, additions and so forth. It is especially good if they come as a "pull request" on BitBucket.

* Faculty Review

Please be honest about what is good and bad about this course. This review is extra important. Whoever comes after me teaching Research Tools needs your take on the class. You should also feel free to talk to me or other CCOM faculty about the course and the material at any time in the future.

26-python-binary-files-part-5.org 5% L33 Hg-30 [#] (Org)

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No.	Date	
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HW 5	2011-12-06	Turn in final log file
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22	2011-11-15	Python: parsing binar
21	2011-11-10	Python: parsing binar
20	2011-11-08	BAGs 3, XML Meta
Vid 18	2011-11-08	Python: Reading a H
Vid 17	2011-11-07	Emacs, HDF5 BAGs
19	2011-11-03	BAGs 2, XML Meta

```

File Edit Options Buffers Tools Org Tbl Help
#+BEGIN_EXAMPLE
Dear Earth Science Students and Faculty,

Please join us for our final Brown Bag of the year. This Thursday we
will have an AGU-style poster session. It will also serve as a end of
the semester get-together and refreshments will be served!

Who*: Posters by- Danielle Grogan, Jake Setera, Kaitlyn Steele, Claire Treat, M
When: Thursday, Dec. 1st at 12:40
Where: James 240 (the other end of the hall from our usual room)

*Additional Posters by Faculty and Students are very welcome
#+END_EXAMPLE

* Copyright

*WARNING:* I am not a lawyer! However, most lawyers know little about
software or data copyright/patent issues. Yes, this topic is boring,
but super important.

#+BEGIN_SRC sh
wtf ianal
# IANAL: I am not a lawyer
#+END_SRC

For the United States: http://www.copyright.gov/circs/circl.pdf (boring!)

It is important to know that in most countries, if you produce raw
data or write software or text, that material is automatically
copyrighted by you or your employer. That means that if you do not
put a license with your data or in your code/writings, other people
are *NOT* allowed to use that material. Most scientists do not want

```

----- 26-python-binary-files-part-5.org 15% L69 Hg-30 [#] (Org) -----

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Mission

The Open Source Initiative (OSI) is a non-profit corporation with global scope formed to educate about and advocate for the benefits of open source and to build bridges among different constituencies in the open source community.

Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in.

One of our most important activities is as a standards body, maintaining [the Open Source Definition](#) for the good of the community. The Open Source Initiative Approved License trademark and program creates a nexus of trust around which developers, users, corporations and governments can organize open source cooperation.

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researchtools@ubuntu: ~/class/26

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open source initiative

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emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

"Intellectual Property" (IP) is a confusing and annoying mess!

You can not just say something is "open source" or "public domain." Public domain requires that you legally give up your copyright. I don't know how to do that. For open source, you must specify a license. "Open Source" has no legal meaning.

- <http://creativecommons.org/about/cc0>
- <http://www.opensource.org/>

Please only pick a standard license. Rolling your own will be a massive disaster! Yes, really.

**** An example of a big problem: Generic Sensor Format**

<http://www.saic.com/maritime/gsf/>

```

#+BEGIN_SRC sh
wget http://www.saic.com/maritime/gsf/download/gsf_0303.zip
unzip gsf_0303.zip # YUCK! Unpacks into the current directory
rm gsf_0303.zip
egrep -i 'license|copyright|gpl|bsd|apache|open source' *.[ch]
#+END_SRC

```

The results:

```

#+BEGIN_EXAMPLE
egrep -i 'license|copyright|gpl|bsd|apache|open source' *.[ch]
gsf.c: * Copyright (C) Science Applications International Corp.
gsf.h: * Copyright (C) Science Applications International Corp.
gsf_dec.c: * Copyright (C) Science Applications International Corp.
gsf_dec.h: * Copyright (C) Science Applications International Corp.

```

26-python-binary-files-part-5.org 23% L111 Hg-30 [#] (Org)

Create a new project

Instantly create your open source hosting project by filling out the form below. For your project, you'll receive:

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- Download/release hosting
- Integrated source code browsing and code review tools
- An issue tracker and project wiki

Version control system

Git
 Mercurial
 Subversion

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Project label(s)

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emacs23@ubuntu

File Edit Options Buffers Tools Org Tbl Help

```

#+BEGIN_SRC sh
wget http://www.saic.com/maritime/gsf/download/gsf_0303.zip
unzip gsf_0303.zip # YUCK! Unpacks into the current directory
rm gsf_0303.zip
egrep -i 'license|copyright|gpl|bsd|apache|open source' *.*[ch]
#+END_SRC

The results:

#+BEGIN_EXAMPLE
egrep -i 'license|copyright|gpl|bsd|apache|open source' *.*[ch]
gsf.c: * Copyright (C) Science Applications International Corp.
gsf.h: * Copyright (C) Science Applications International Corp.
gsf_dec.c: * Copyright (C) Science Applications International Corp.
gsf_dec.h: * Copyright (C) Science Applications International Corp.
gsf_enc.c: * Copyright (C) Science Applications International Corp.
gsf_enc.h: * Copyright (C) Science Applications International Corp.
gsf_ft.h: * Copyright (C) Science Applications International Corp.
gsf_indx.c: * Copyright (C) ACME Software, A Subsidiary of Fly By Night Industri
gsf_indx.h: * Copyright (C) Science Applications International Corp.
gsf_info.c: * Copyright (C) Science Applications International Corp.
#+END_EXAMPLE

Searching the 3 pdfs in the zip, I find no mention of copyright or
license. But that does not give you *any* rights to do anything other
than read what you downloaded.

But, MB-System, Fledermaus, Hypack, Caris and many others use the GSF
code. While no one wants to cause trouble, this is a serious legal
mine field.

** Open Source Licenses for Source Code

```

26-python-binary-files-part-5.org 27% L117 Hg-30 [#] (Org)

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emac23@ubuntu

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Google



Open Source Initiative

Home > Open Source Licenses

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- Adaptive Public License (APL-1.0)
- Apache License 2.0 (Apache-2.0)
- Apple Public Source License (APSL-2.0)
- Artistic license 2.0 (Artistic-2.0)
- Attribution Assurance Licenses (AAL)
- BSD 3-Clause "New" or "Revised" License (BSD-3-Clause)
- BSD 2-Clause "Simplified" or "FreeBSD" License (BSD-2-Clause)
- Boost Software License (BSL-1.0)
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- Open Standards
- Open Source Education
- Mailing lists
- Getting Help

Comparison of free software licenses - Wikipedia, the free encyclopedia - Mozilla Firefox

en.wikipedia.org/wiki/Comparison_of_free_software_licences

License	Author	Latest version	Publication date	code using a different license	changes under a different license
Academic Free License	Lawrence E. Rosen	3	2002	Yes	Yes
Affero GPL	Free Software Foundation	3	2007	No	No
Apache License	Apache Software Foundation	2.0	2004	Yes	Yes
Apple Public Source License	Apple Computer	2.0	August 6, 2003	Yes	No
Artistic License	Larry Wall	2.0	2000	Yes	With restrictions
Berkeley Database License	Oracle Corporation	?	February 7, 2008	No	No
BSD license	Regents of the University of California	?	?	Yes	Yes
Boost Software License	?	1.0	August 17, 2003	Yes	Yes
Common Development and Distribution License	Sun Microsystems	1.0	December 1, 2004	Yes	Yes
Code Project Open License	The Code Project	1.0	2007	Yes	No

Comparison of free software licenses - Wikipedia, the free encyclopedia - Mozilla Firefox

en.wikipedia.org/wiki/Comparison_of_free_software_licences

License and specific version	FSF approval ^[3]	Compatible with GPL	OSI approval ^[2]	Debian approval ^{[4][5]}	Fedora Project approval ^[6]
Academic Free License	Yes	No	Yes	?	Yes
Affero GPL version 3	Yes	Yes ²	Yes	Yes	?
Apache License version 1	Yes	No	Yes	Yes	Yes
Apache License version 1.1	Yes	No	Yes	Yes	Yes
Apache License version 2	Yes	Yes ²	Yes	Yes	Yes
Apple Public Source License version 1.x	No	No	?	No	No
Apple Public Source License version 2.0	Yes	No	Yes	No	Yes
Artistic License 1.0	No	No	Yes	Yes	No
Clarified Artistic License (draft 2.0)	Yes	Yes	Yes	Yes	Yes
Artistic License 2.0	Yes	Yes	Yes	Yes	Yes
Berkeley Database License	Yes	Yes	Yes	?	?
original BSD license	Yes	No	No ^[7]	No	Yes

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help

In [1]: rtupdate
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7
c:b4:75:ce:9b:6c:48:94:56:a1:fe not verified (check hostfingerprints or web.cac
rts config setting)
pulling from https://bitbucket.org/schwehr/researchtools
warning: bitbucket.org certificate with fingerprint 81:2b:08:90:dc:d3:71:ee:e0:7
c:b4:75:ce:9b:6c:48:94:56:a1:fe not verified (check hostfingerprints or web.cac
rts config setting)
searching for changes
no changes found
resolving manifests
0 files updated, 0 files merged, 0 files removed, 0 files unresolved

In [2]: mkdir ~/class/26
mkdir: cannot create directory `/home/researchtools/class/26': File exists

In [3]: cd ~/class/26
/home/researchtools/class/test-26

In [4]: pwd
Out[4]: '/home/researchtools/class/26'

In [5]: book c26

```

```

Help
d processing multibeam sonar
ke)
NASA World Wind
rk protocols
roj and gdal
ArcGIS, Caris, Hypack,
ics or ask your fellow students
sh shell, but we can do everything from i

```



```

# update your mercurial repository of the class notes
# Use your alias
rtupdate

# The alias should do this:
# !(cd /home/researchtools/projects/researchtools/; hg pull; hg update)

mkdir ~/class/26
cd ~/class/26
bookmark c26
bookmark -l

```

----- 26-python-binary-files-part-5.org 60% L248 Hg-30 [#] (Org) -----

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
In [3] Copy Shift+Ctrl+C
/home Paste Shift+Ctrl+V
In [4] Select All
Out[4] Profiles...
In [5] Keyboard Shortcuts...
In [6] Profile Preferences
Current bookmarks:
c24 -> /home/researchtools/class/24
c26 -> /home/researchtools/class/26
hgclass -> /home/researchtools/projects/researchtools/class

In [7]: logstart -o -r log-class-26.py
Activating auto-logging. Current session state plus future input saved.
Filename      : log-class-26.py
Mode          : backup
Output logging : True
Raw input log  : True
Timestamping  : False
State         : active

In [8]:

```

```

Help
Icons or ask your fellow students

sh shell, but we can do everything from i

he class notes

earchtools/; hg pull; hg update)

```



```

logstart -o -r log-class-26.py

# Fetch the sbet file:

!curl -0 http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/
!curl -0 http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/
!curl -0 http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/

!bunzip2 sample.sbet.bz2
!bunzip2 2010_202_S220_subsampled.sbet.bz2
----- 26-python-binary-files-part-5.org 62% L260 Hg-30 [#] (Org) -----
menu-bar edit copy

```

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
100 9779 100 9779 0 0 326k 0 --:--:-- --:--:-- --:--:-- 954k

In [10]: !curl -O http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/examples/24/2011_194_S250A_Stbd_subsampled.sbet.bz2
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 35398 100 35398 0 0 871k 0 --:--:-- --:--:-- --:--:-- 1728k

In [11]: ls -l
total 76
-rw-r--r-- 1 researchtools researchtools 9779 2011-12-01 11:43 2010_202_S220_subsampled.sbet.bz2
-rw-r--r-- 1 researchtools researchtools 35398 2011-12-01 11:43 2011_194_S250A_Stbd_subsampled.sbet.bz2
-rw-r--r-- 1 researchtools researchtools 807 2011-12-01 11:43 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22473 2011-12-01 11:43 sample.sbet.bz2

In [12]: !bunzip2 sample.sbet.bz2

In [13]: !bunzip2 2010_202_S220_subsampled.sbet.bz2

In [14]: !bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2

In [15]: ls

```

```

Help
researchtools/; hg pull; hg update)
hwehr/Classes/2011/esci895-researchtools/
hwehr/Classes/2011/esci895-researchtools/
hwehr/Classes/2011/esci895-researchtools/
bz2
.sbet.bz2
e.sbet

```



```

!md5sum 2010_202_S220_subsampled.sbet
e8f7283deb887e16b05b08581bd7d2bb 2010_202_S220_subsampled.sbet

!md5sum 2011_194_S250A_Stbd_subsampled.sbet
72e5bab716485b53ecde9aa1cfc90719 2011_194_S250A_Stbd_subsampled.sbet
#+END_SRC

* Where were we?

Rather than paste in the code from the org file, we will copy the code
----- 26-python-binary-files-part-5.org 65% L264 Hg-30 [#] (Org)-----
menu-bar edit copy

```

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
bsampled.sbet.bz2
-rw-r--r-- 1 researchtools researchtools
tbd_subsampled.sbet.bz2
-rw-r--r-- 1 researchtools researchtools
-rw-r--r-- 1 researchtools researchtools

In [12]: !bunzip2 sample.sbet.bz2

In [13]: !bunzip2 2010_202_S220_subsampl

In [14]: !bunzip2 2011_194_S250A_Stbd_su

In [15]: ls -l
total 112
-rw-r--r-- 1 researchtools researchtools
bsampled.sbet
-rw-r--r-- 1 researchtools researchtools
tbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools
-rw-r--r-- 1 researchtools researchtools

In [16]: cp ~/projects/researchtools/cla

In [17]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help

#!/usr/bin/env python

'''Decode Applanix POSPac SBET IMU binary files

Starting point for Class 26.
'''

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

def num_datagrams(data):
    'How many packets are in data'

    assert( len(data) % datagram_size == 0 )

    return len(data) / datagram_size

def get_offset(datagram_number):
    'Calculate the starting offset of a datagram. First datagram is number 0'
    return datagram_number * datagram_size

def decode(data, offset=0):
    'Decipher a SBET datagram from binary'

----- sbet.py Top L1 [#] (Python yas) -----
Using the CPython shell

```



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
In [13]: !bunzip2 2010_202_S220_subsampled.sbet.bz2
In [14]: !bunzip2 2011_194_S250A_Stbd_subsampled.sbet.bz2
In [15]: ls -l
total 112
-rw-r--r-- 1 researchtools researchtools 9656 2011-12-01 11:43 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-12-01 11:43 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 930 2011-12-01 11:43 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-12-01 11:43 sample.sbet
In [16]: cp ~/projects/researchtools/class/code/26-sbet.py sbet.py
In [17]: import sys
In [18]: sys.flags
sys.flags          sys.float_info    sys.float_repr_style
In [18]: sys.float_info
sys.float_info     sys.float_repr_style
In [18]: sys.float_

```

```

Help
n=sys.float_info.epsilon):
of no position data at 0,0:
enumerate(load_sbet_file(filename)):
74% L293 Hg-30 [#] (Org)-----
ry 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', \
)

```

sbet.py Top L6 [#] (Python yas)

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
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.__getattr__
sys.float_info.__getitem__
sys.float_info.__getslice__
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__
sys.float_info.__le__
sys.float_info.__len__
sys.float_info.__lt__
sys.float_info.__mul__
sys.float_info.__ne__
sys.float_info.__new__
sys.float_info.__reduce__

In [18]: sys.float_info.epsilon
Out[18]: 2.220446049250313e-16

In [19]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools Org Tbl Help
#+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']

```

```

----- 26-python-binary-files-part-5.org 74% L301 Hg-30 [#] (Org) -----
#!/usr/bin/env python
'''Decode Applanix POSPac SBET IMU binary files

Starting point for Class 26.
'''

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', \

```

```

----- sbet.py Top L6 [#] (Python yas) -----

```



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
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.__getattr__
sys.float_info.__getitem__
sys.float_info.__getslice__
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__
sys.float_info.__le__
sys.float_info.__len__
sys.float_info.__lt__
sys.float_info.__mul__
sys.float_info.__ne__
sys.float_info.__new__
sys.float_info.__reduce__

In [18]: sys.float_info.epsilon
Out[18]: 2.220446049250313e-16

In [19]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
return False
return True
#+END_SRC

Then we need to use that to skip zero values.

#+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

sbet_values = dict(zip (field_names, values))

sbet_values['lat_deg'] = math.degrees(sbet_values['latitude'])
sbet_values['lon_deg'] = math.degrees(sbet_values['longitude'])

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)

```

- *Rescan*
- num_datagrams
- get_offset
- decode
- load_sbet_file**
- main



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
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.__getattr__
sys.float_info.__getitem__
sys.float_info.__getslice__
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__
sys.float_info.__le__
sys.float_info.__len__
sys.float_info.__lt__
sys.float_info.__mul__
sys.float_info.__ne__
sys.float_info.__new__
sys.float_info.__reduce__

In [18]: sys.float_info.epsilon
Out[18]: 2.220446049250313e-16

In [19]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
*Rescan*
num_datagrams
get_offset
decode
load_sbet_file
main
for datagram_index, datagram in enumerate(load_sbet_file(filename)):
    x=datagram['lon_deg']
    y=datagram['lat_deg']

    if datagram_index % 100 == 0:
        print datagram_index, 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?

----- 26-python-binary-files-part-5.org 77% L314 Hg-30 [#] (Org) -----
print 'filenames:', args.filenames

for filename in args.filenames:
    print '====',filename,'===='
    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 )):

----- sbet.py 67% L81 [#] (Python yas) -----

```



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
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.__getattr__
sys.float_info.__getitem__
sys.float_info.__getslice__
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__
sys.float_info.__le__
sys.float_info.__len__
sys.float_info.__lt__
sys.float_info.__mul__
sys.float_info.__ne__
sys.float_info.__new__
sys.float_info.__reduce__

In [18]: sys.float_info.epsilon
Out[18]: 2.220446049250313e-16

In [19]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
Line Wrapping in this Buffer
  • Wrap at Window Edge
  Truncate Long Lines
  Word Wrap (Visual Line mode)
t_equal(0., y):
ro,zero... no data
rvey at 0,0
,y=y))
L314 Hg-30 [#] (Org)-----
erate(load_sbet_file( filename )):
am['time'], datagram['lon_deg'], dat
_ equal(
atagram['lon_deg'], y=datagram['lat_
deg' ]))

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

sbet.py 81% L94 [#] (Python yas)-----

```



```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
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.__getattr__
sys.float_info.__getitem__
sys.float_info.__getslice__
sys.float_info.__gt__
sys.float_info.__hash__
sys.float_info.__init__
sys.float_info.__le__
sys.float_info.__len__
sys.float_info.__lt__
sys.float_info.__mul__
sys.float_info.__ne__
sys.float_info.__new__
sys.float_info.__reduce__

In [18]: sys.float_info.epsilon
Out[18]: 2.220446049250313e-16

In [19]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
args = parser.parse_args() # uses sys.argv

print 'filenames:', args.filenames

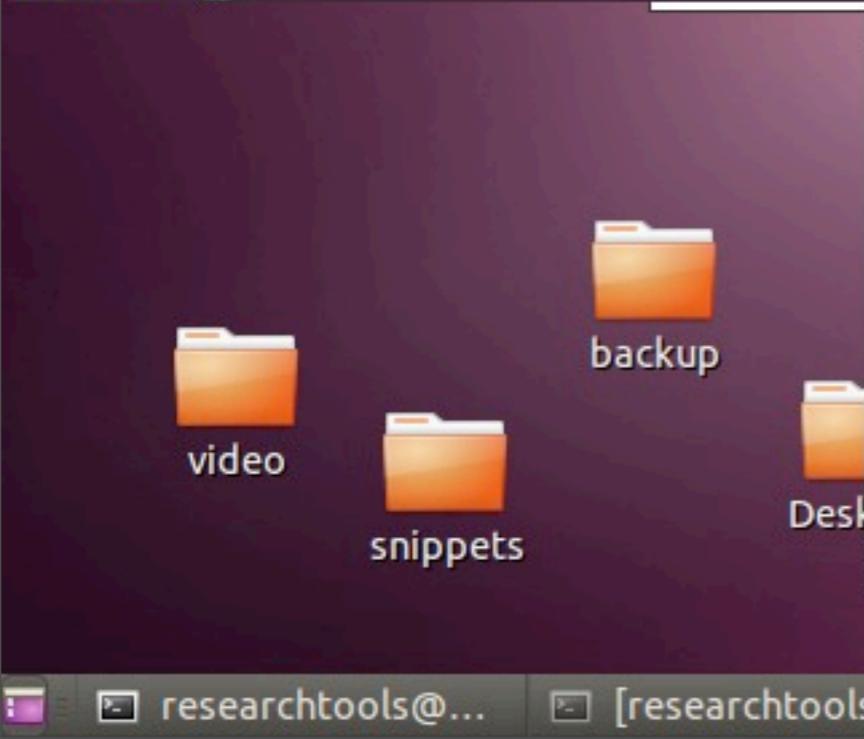
for filename in args.filenames:
    print '====',filename,'===='
    out = open(filename+'.kml', 'w')
    out.write('''<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Document>
    <Placemark>
      <name>{filename}</name>
      <LineString>
        <coordinates>
          '''.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']
            if almost_equal(0.,x) and almost_equal(0.,y):
                continue
            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>
    ''')

----- sbet.py 62% L95 [#] (Python yas) -----
Wrote /home/researchtools/class/26/sbet.py

```



researchtools@ubuntu: ~/class/26

File Edit View Search Terminal Help

```

bsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-12-01 11:43 2011_194_S250A_S
tbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 1058 2011-12-01 11:54 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-12-01 11:43 sample.sbet
-rw-r--r-- 1 researchtools researchtools 3188 2011-12-01 11:54 sbet.py
-rw-r--r-- 1 researchtools researchtools 2903 2011-12-01 11:44 sbet.py~

In [20]: 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 [21]: run sbet.py 2011_194_S250A_Stbd_subsampled.sbet

```

Help

help='SBET files')

t_file(filename)):

```

        print datagram_index, datagram['time'], datagram['lon_deg'], dat
    datagram['lat_deg']
        if almost_equal(0.,x) and almost_equal(0.,y):
            continue
        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>
    ... )

```

sbet.py 62% L95 [#] (Python yas)

Wrote /home/researchtools/class/26/sbet.py



```

NameError                                Traceback (most recent call last)

/home/researchtools/class/26/sbet.py in <module>()
    106 if __name__ == '__main__':
    107     print 'starting to run script...'
--> 108     main()
    109     print 'script done!'
    110

/home/researchtools/class/26/sbet.py in main()
     92         if datagram_index % 20 == 0:
     93             print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_
deg']
--> 94             if almost_equal(0.,x) and almost_equal(0.,y):
     95                 continue
     96             out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

NameError: global name 'x' is not defined
WARNING: Failure executing file: <sbet.py>

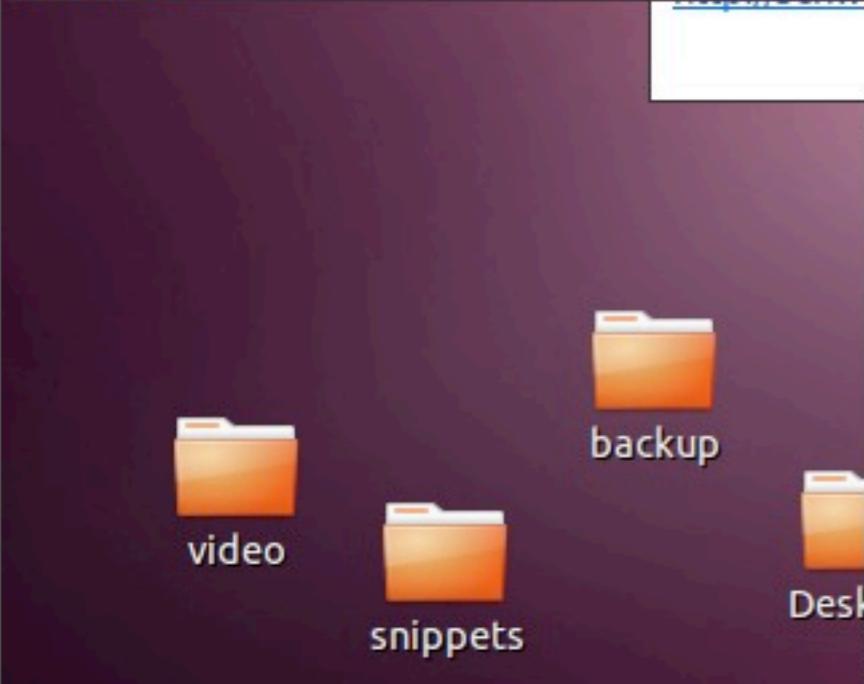
In [22]:

```

Help

help='SBET files')

t_file(filename)):



```

print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
if almost_equal(0.,x) and almost_equal(0.,y):
    continue
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>
... )

```

sbet.py 62% L97 [#] (Python yas)

```

NameError

/home/researchtools/
106 if __name__
107     print 's
--> 108     main()
109     print 's
110

/home/researchtools/
92
93
deg']
---> 94
95
96

NameError: global na
WARNING: Failure exe

In [22]:

```

```

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')
    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']
    if almost_equal(0.,x) and almost_equal(0.,y):
        continue
    out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

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

```

sbet.py 62% L96 [#] (Python yas)

```

researchtools
File Edit View Sea File Edit Options Buffers Tools IM-Python Python YASnippet Help

NameError

/home/researchtools/
106 if __name__
107     print 's
--> 108     main()
109     print 's
110

/home/researchtools/
92
93
deg']
---> 94
95
96

NameError: global na
WARNING: Failure exe

In [22]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help

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')
    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) )
        </coordinates>
      </LineString>
    </Placemark>
  </Document>
</kml>
    ...

print 'Datagram Number, Time, x, y'
for datagram_index, datagram in enumerate(load_sbet_file( filename )):

    x=datagram['lon_deg'], y=datagram['lat_deg']
    if datagram_index % 20 == 0:
        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
    if almost_equal(0.,x) and almost_equal(0.,y):
        continue
    out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

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

--:**- sbet.py 61% L93 [#] (Python yas)

```

```

researchtoo
File Edit View Sea File Edit Options Buffers Tools IM-Python Python YASnippet Help

NameError

/home/researchtools/
106 if __name__
107     print 's
--> 108     main()
109     print 's
110

/home/researchtools/
92
93
deg']
---> 94
95
96

NameError: global na
WARNING: Failure exe

In [22]:

```

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help

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')
    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 )):

    x=datagram['lon_deg']
    y=datagram['lat_deg']
    if datagram_index % 20 == 0:
        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
    if almost_equal(0.,x) and almost_equal(0.,y):
        continue
    out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

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

--:-- sbet.py 60% L95 [#] (Python yas)
Wrote /home/researchtools/class/26/sbet.py

```

```

160 289498.485012 -7
180 291498.545265 -7
200 293498.605513 -7
220 295498.665747 -7
240 297498.726 -75.5
260 299498.786282 -7
280 0.0 0.0 0.0
300 0.0 0.0 0.0
320 0.0 0.0 0.0
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 -7
script done!
In [23]:

```

```

File Edit View Sea File Edit Options Buffers Tools IM-Python Python YASnippet 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')
    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 )):

    x=datagram['lon_deg']
    y=datagram['lat_deg']

    if datagram_index % 20 == 0:
        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
    if almost_equal(0.,x) and almost_equal(0.,y):
        continue
    out.write('{x},{y}\n'.format(x=datagram['lon_deg'], y=datagram['lat_deg']))

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

```

---:--- sbet.py 58% L94 [#] (Python yas)-----

```

160 289498.485012 -7
180 291498.545265 -7
200 293498.605513 -7
220 295498.665747 -7
240 297498.726 -75.5
260 299498.786282 -7
280 0.0 0.0 0.0
300 0.0 0.0 0.0
320 0.0 0.0 0.0
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 -7
script done!
In [23]:

```

```

File Edit View Sea File Edit Options Buffers Tools IM-Python Python YASnippet 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')
    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 )):

    x=datagram['lon_deg']
    y=datagram['lat_deg']

    if datagram_index % 20 == 0:
        print datagram_index, datagram['time'], datagram['lon_deg'], datagram['lat_deg']
    if almost_equal(0.,x) and almost_equal(0.,y):
        continue
    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>

```

researchtools@ubuntu: ~/class/26

File Edit View Search Terminal Help

```

Starting main
filenames: ['2011_194_S250A_Stbd_subsampled.sbet']
==== 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
80 281498.244734 -75.6296578787 37.0137003076
100 283498.304712 -75.6345773566 37.0144177023
120 285498.364735 -75.552605247 37.0144545719
140 287498.424822 -75.5230051401 37.0154931321
160 289498.485012 -75.6045727647 37.0156019109
180 291498.545265 -75.6613422226 37.0160430919
200 293498.605513 -75.5837033162 37.0163109221
220 295498.665747 -75.5011903989 37.0152076818
240 297498.726 -75.576711627 37.0167642931
260 299498.786282 -75.6577022044 37.0168299723
520 299498.786282 -75.6577022044 37.0168299723
script done!

```

In [24]:

```

x=datagram['lon_deg']
y=datagram['lat_deg']

if almost_equal(0.,x) and almost_equal(0.,y):
    continue
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\t</LineString>
\t\t\t\t</Placemark>

```

---:--- sbet.py 58% L98 [#] (Python yas) -----
Wrote /home/researchtools/class/26/sbet.py

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [24]: ls -l
total 132
-rw-r--r-- 1 researchtools researchtools 9656 2011-12-01 11:43 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-12-01 11:43 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 8652 2011-12-01 12:01 2011_194_S250A_Stbd_subsampled.sbet
.kml
-rw-r--r-- 1 researchtools researchtools 1227 2011-12-01 12:01 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-12-01 11:43 sample.sbet
-rw-r--r-- 1 researchtools researchtools 3270 2011-12-01 12:01 sbet.py
-rw-r--r-- 1 researchtools researchtools 2903 2011-12-01 11:44 sbet.py~

In [25]: less 201
2010_202_S220_subsampled.sbet          2011_194_S250A_Stbd_subsampled.sbet.kml
2011_194_S250A_Stbd_subsampled.sbet

In [25]: less 2011
2011_194_S250A_Stbd_subsampled.sbet    2011_194_S250A_Stbd_subsampled.sbet.kml

In [25]: less 2011_194_S250A_Stbd_subsampled.sbet.kml

```

```

x=datagram['lon_deg']
y=datagram['lat_deg']

if almost_equal(0.,x) and almost_equal(0.,y):
    continue
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\t</LineString>
\t\t\t\t</Placemark>

```

---:--- sbet.py 58% L98 [#] (Python yas) -----

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

File Edit View Search Terminal Help

```

<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Document>
    <Placemark>
      <name>2011_194_S250A_Stbd_subsampled.sbet</name>
      <LineString>
        <coordinates>
          -75.6779674319,36.9993413966
          -75.6740340371,37.0040826154
          -75.6710861487,37.0077310223
          -75.6697928439,37.009079767
          -75.6689641119,37.0098427375
          -75.6679099699,37.0105511556
          -75.6643600555,37.0128776179
          -75.6608880281,37.0155595117
          -75.6609783787,37.0182239173
          -75.6649373548,37.0178673837
          -75.6686272625,37.0166578669
          -75.6707971981,37.0141164098
          -75.6677181878,37.0127678218
          -75.6630751009,37.0128266017
        </coordinates>
      </LineString>
    </Placemark>
  </Document>
</kml>

```

2011_194_S250A_Stbd_subsampled.sbet.kml

```

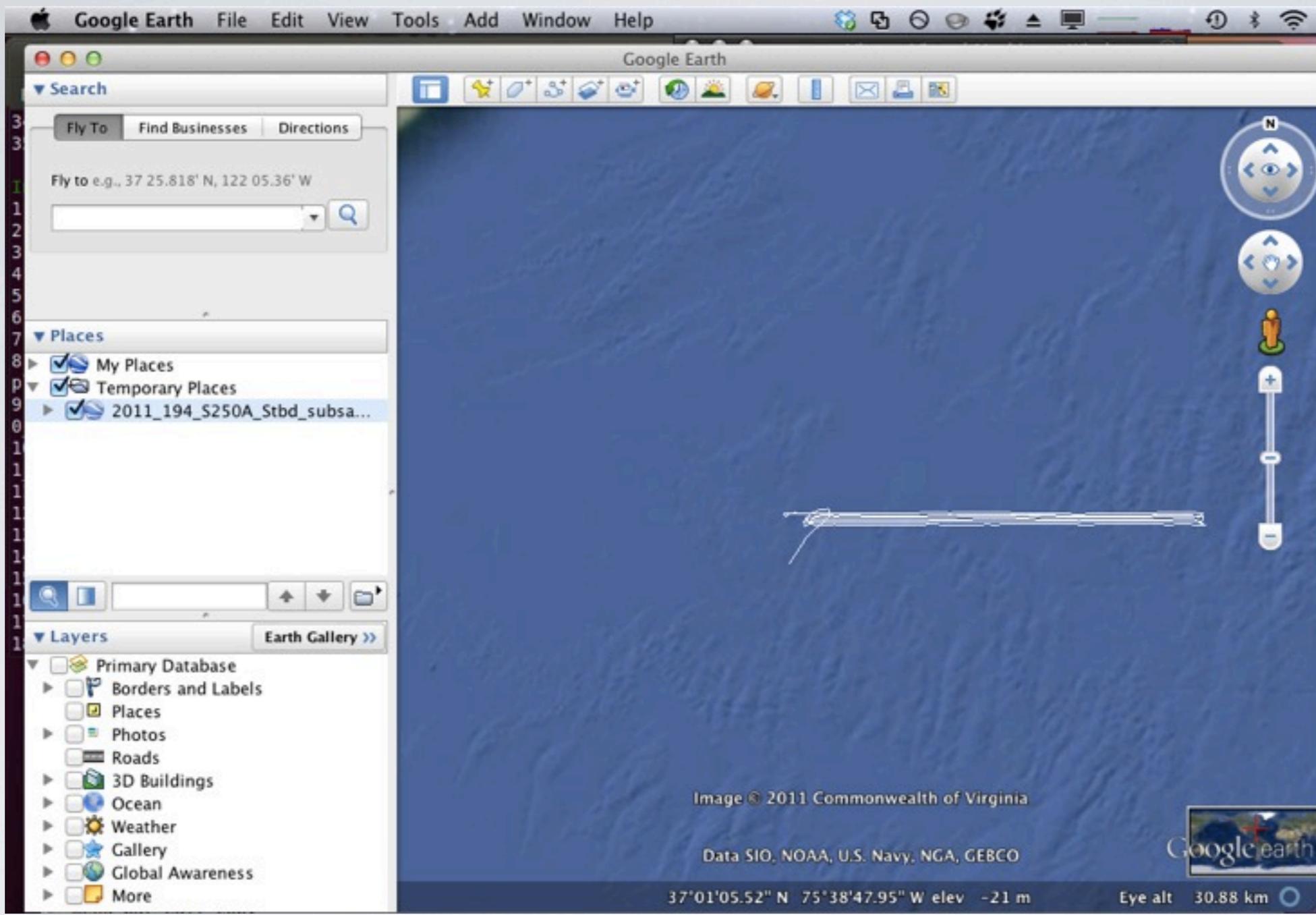
x=datagram['lon_deg']
y=datagram['lat_deg']

if almost_equal(0.,x) and almost_equal(0.,y):
    continue
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\t</coordinates>
\t\t\t\t</LineString>
\t\t</Placemark>

```

---:--- sbet.py 58% L98 [#] (Python yas) -----
Wrote /home/researchtools/class/26/sbet.py



emacs23@ubuntu

File File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
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 sbet_to_sql(sbet_filename, db_filename):
    import sqlite3

    cx = sqlite3.connect(db_filename)

    # This leaves out most of the fields, but it's good enough for now
    cx.execute('CREATE TABLE IF NOT EXISTS sbet_entry ( time REAL, y REAL, x REAL, z REAL, x_vel REAL);')

    for datagram_index, datagram in enumerate(load_sbet_file(sbet_filename)):
        cx.execute('INSERT INTO sbet_entry (time, x, y, z) VALUES (:time, :longitude, :latitude, :altitude);',
                  datagram);

    cx.commit()

def main():
    import glob
    import sys

    print 'Starting main'
```

--:**- sbet.py 37% L77 [#] (Python yas)-----

C-x-

researchtools@ubuntu: ~/class/26

File Edit View Search Terminal Help

positional arguments:

filenames SBET files

optional arguments:

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

--sqlite

In [28]: run sbet.py --help

starting to run script...

Starting main

usage: sbet.py [-h] [--sqlite] filenames [filenames ...]

Parse SBET files

positional arguments:

filenames SBET files

optional arguments:

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

-sqlite Write a SQLite database

In [29]: run sbet.py 2011_194_S250A_Stbd_subsampled.sbet --sqlite

```
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')
```

```
parser.add_argument('--sqlite', action="store_true", default=False, help='Write a SQLite database')
```

```
args = parser.parse_args() # uses sys.argv
```

```
print 'filenames:', args.filenames
```

```
--:-- sbet.py 59% L89 [#] (Python yas)-----
```

```
Wrote /home/researchtools/class/26/sbet.py
```

researchtools@...

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emacs23@ubuntu

Research Tools C...

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```

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
80 281498.244734 -75.6296578787 37.0137003076
100 283498.304712 -75.6345773566 37.0144177023
120 285498.364735 -75.552605247 37.0144545719
140 287498.424822 -75.5230051401 37.0154931321
160 289498.485012 -75.6045727647 37.0156019109
180 291498.545265 -75.6613422226 37.0160430919
200 293498.605513 -75.5837033162 37.0163109221
220 295498.665747 -75.5011903989 37.0152076818
240 297498.726 -75.576711627 37.0167642931
260 299498.786282 -75.6577022044 37.0168299723
520 299498.786282 -75.6577022044 37.0168299723
script done!

```

In [30]: ls -l

```

total 132
-rw-r--r-- 1 researchtools researchtools 9656 2011-12-01 11:43 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-12-01 11:43 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 8652 2011-12-01 12:17 2011_194_S250A_Stbd_subsampled.sbet
.kml
-rw-r--r-- 1 researchtools researchtools 1445 2011-12-01 12:18 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-12-01 11:43 sample.sbet
-rw-r--r-- 1 researchtools researchtools 3894 2011-12-01 12:17 sbet.py
-rw-r--r-- 1 researchtools researchtools 2903 2011-12-01 11:44 sbet.py~

```

In [31]:

```

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
parser.add_argument('--sqlite', action="store_true", default=False, help='Write a SQLite database')
args = parser.parse_args() # uses sys.argv

print 'filenames:', args.filenames

```

--:-- sbet.py 59% L89 [#] (Python yas)

Wrote /home/researchtools/class/26/sbet.py

```

emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
0 20 40 60 80 100 120 140 160 180 200 220 240 260 520 scr
parser.add_argument('--sqlite', action="store_true", default=False)

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

for filename in args.filenames:
    print 'Working on file:',filename

    # If the --sqlite command line argument is true, then let's
    # write an sqlite file!

    if args.sqlite:
        sbet_to_sql(filename, filename+'.sqlite')

# Code to write kml continues after this
#+END_SRC
----- 26-python-binary-files-part-5.org 91% L387 Hg-30 [#] (Org) -----
import sys, argparse

parser = argparse.ArgumentParser(description='Parse SBET files')
parser.add_argument('filenames', type=str, nargs='+', help='SBET files')
parser.add_argument('--sqlite', action="store_true", default=False, help='Write a SQLite database')
args = parser.parse_args() # uses sys.argv

print 'filenames:', args.filenames

for filename in args.filenames:

    if args.sqlite:
        sbet_to_sql(filename, filename + '.sqlite')

    print '====',filename,'===='
    out = open(filename+'.kml', 'w')
----- sbet.py 60% L97 [#] (Python yas) -----
Wrote /home/researchtools/class/26/sbet.py

```

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
In [31]: run sbet.py 2011_194_S250A_Stbd_subsampled.sbet
starting to run script...
Starting main
filenames: ['2011_194_S250A_Stbd_subsampled.sbet']
sqlite? False
==== 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
80 281498.244734 -75.6296578787 37.0137003076
100 283498.304712 -75.6345773566 37.0144177023
120 285498.364735 -75.552605247 37.0144545719
140 287498.424822 -75.5230051401 37.0154931321
160 289498.485012 -75.6045727647 37.0156019109
180 291498.545265 -75.6613422226 37.0160430919
200 293498.605513 -75.5837033162 37.0163109221
220 295498.665747 -75.5011903989 37.0152076818
240 297498.726 -75.576711627 37.0167642931
260 299498.786282 -75.6577022044 37.0168299723
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [32]:

```

```

print 'filenames:', args.filenames
print 'sqlite?', args.sqlite

for filename in args.filenames:
    if args.sqlite:
        sbet_to_sql(filename, filename + '.sqlite')

    print '====', filename, '===='

```

--:-- sbet.py 60% L93 [#] (Python yas) -----

Wrote /home/researchtools/class/26/sbet.py

```

researchtools@ubuntu: ~/class/26
File Edit View Search Terminal Help
260 299498.786282 -75.6577022044 37.0168299723
520 299498.786282 -75.6577022044 37.0168299723
script done!

In [33]: ls -l
total 152
-rw-r--r-- 1 researchtools researchtools 9656 2011-12-01 11:43 2010_202_S220_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 72488 2011-12-01 11:43 2011_194_S250A_Stbd_subsampled.sbet
-rw-r--r-- 1 researchtools researchtools 8652 2011-12-01 12:20 2011_194_S250A_Stbd_subsampled.sbet
.kml
-rw-r--r-- 1 researchtools researchtools 18432 2011-12-01 12:20 2011_194_S250A_Stbd_subsampled.sbet
.sqlite
-rw-r--r-- 1 researchtools researchtools 1557 2011-12-01 12:20 log-class-26.py
-rw-r--r-- 1 researchtools researchtools 22712 2011-12-01 11:43 sample.sbet
-rw-r--r-- 1 researchtools researchtools 4017 2011-12-01 12:19 sbet.py
-rw-r--r-- 1 researchtools researchtools 2903 2011-12-01 11:44 sbet.py~

In [34]: !file 2011
2011_194_S250A_Stbd_subsampled.sbet          2011_194_S250A_Stbd_subsampled.sbet.sqlite
2011_194_S250A_Stbd_subsampled.sbet.kml

In [34]: !file 2011_194_S250A_Stbd_subsampled.sbet.sqlite
2011_194_S250A_Stbd_subsampled.sbet.sqlite: SQLite 3.x database

In [35]:

```

```

print 'filenames:', args.filenames
print 'sqlite?', args.sqlite

for filename in args.filenames:
    if args.sqlite:
        sbet_to_sql(filename, filename + '.sqlite')

    print '====', filename, '===='

```

--:-- sbet.py 60% L93 [#] (Python yas) -----

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vislab-ccom.unh.edu/~schwehr

Downloads Ctrl+Shift+Y
Add-ons Ctrl+Shift+A
Set Up Sync...
SQLite Manager
Web Developer
Page Info Ctrl+I
Start Private Browsing Ctrl+Shift+P
Clear Recent History... Ctrl+Shift+Del
ChatZilla
Manage Content Plug-ins

No.	Date		Present	Video	Blog
28	2011-12-08	No Class			
27	2011-12-06	No Class			
HW 5	2011-12-06	Turn in final log file			
26	2011-12-01	Last Class			
25	2011-11-29	Rob Braswell: 1-In	pdf-1 pdf-2		comment
Vid 19	2011-11-27	Mercurial (hg) for version control	pdf key	YouTube H264	
	2011-11-24	No Class - Thanksgiving			
24	2011-11-22	Python: parsing binary data - SBETs - Part 4	mp3 pdf key		comment
23	2011-11-17	Python: parsing binary data - SBETs - Part 3	mp3 pdf key		comment
22	2011-11-15	Python: parsing binary data - SBETs - Part 2	mp3 pdf key		comment
21	2011-11-10	Python: parsing binary data - SBETs - Part 1	mp3 pdf key		comment
20	2011-11-08	BAGs 3, XML Metadata, KML, and GSHHS shapefile	mp3 pdf key		comment
Vid 18	2011-11-08	Python: Reading a HDF5 BAGs - h5py, matplotlib	pdf key	YouTube H264	
Vid 17	2011-11-07	Emacs, HDF5 BAGs and XML Metadata	pdf key	YouTube H264	
19	2011-11-03	BAGs 2, XML Metadata	mp3 pdf key		comment

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

Add-ons Manager - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Index of /~schwehr/rt Add-ons Manager

sqlite

Name Last Updated Best match

Search: My Add-ons Available Add-ons

	AddonFox - Best Firefox Addons! 1.2 Automatically install the best Firefox addons! Includes... More	09/08/2011	Install
	Yoono: Twitter Facebook Linked... 7.6.16 All your social networks and instant messaging in one ... More	10/14/2011	Install
	QuickFox Notes 2.6D QuickFox Notes is a multi-tab note taking add-on for F... More	11/27/2011	Install
	Lazarus: Form Recovery 2.3 Never lose anything you type into a web form again! La... More	08/11/2011	Install
	Webutation - Reputation & Security 1.0.5 Would you like to know which websites are safe and w... More	08/09/2011	Install
	Vacuum Places Improved 1.2	01/13/2011	Install

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Languages

Extensions

Appearance

Plugins

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

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File Edit View History Bookmarks Tools Help

SQLite Manager

Database Table Index View Trigger Tools Help

Directory (Select Profile Database) Go

Connect Database Structure Browse & Search Execute SQL DB Settings

Database Not Selected

Gecko 8.0 0.7.7 -- Number of files in selected directory: 13

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

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File Edit View History Bookmarks Tools Help

SQLite Manager

Databases

Select SQLite Database

researchtools class 26

Places	Name	Size	Modified
Search	2011_194_S250A_Stbd_subsampled.sbet.sqlite	18.0 KB	12:20
Recently Used			
researchtools			
File System			
Floppy Drive			
snippets			

Add Remove

SQLite DB Files (*.sqlite;)
All Files

researchtools@ubuntu: ~/class/26

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File Edit View History Bookmarks Tools Help

SQLite Manager - /home/researchtools/class/26/2011_194_S250A_Stbd_subsampled.sbet.sqlite

Database Table Index View Trigger Tools Help

Directory (Select Profile Database) Go

2011_194_S250...

Structure Browse & Search Execute SQL DB Settings

TABLE sbet_entry Search Show All Add Duplicate Edit De

rowid	time	y	x	z	x_vel
1	273498.00614401...	0.6457603284400...	-1.320829702903...	-40.45023614456...	
2	273598.00912020...	0.6458430783179...	-1.320761052213...	-40.74643455925...	
3	273698.01209639...	0.6459067550324...	-1.320709601855...	-40.60643868982...	
4	273798.01507258...	0.6459302950668...	-1.320687029427...	-40.61951600131...	
5	273898.01804778...	0.6459436114147...	-1.320672565326...	-40.35614336623...	
6	273998.02102299...	0.6459559756437...	-1.320654167077...	-40.47689076454...	
7	274098.02399918...	0.6459965800701...	-1.320592209382...	-40.75224789663...	
8	274198.02697537...	0.6460433879478...	-1.32053161107379	-40.56629224302...	
9	274298.02995057...	0.6460898905975...	-1.320533187988...	-40.68743343158...	
10	274398.03292676...	0.6460836679115...	-1.320602285156...	-40.64719842078...	
11	274498.03590295...	0.6460625578625...	-1.320666686194...	-40.54399577547...	
12	274598.03887816...	0.6460182010675...	-1.320704558714...	-40.47095382546...	
13	274698.04185435...	0.6459946637659...	-1.320650819847...	-40.6575391285005	
14	274798.044828567	0.6459956896694...	-1.320569782694...	-40.69091266629...	
15	274898.04780574...	0.6459967753243...	-1.320488466402...	-40.60789548781...	
16	274998.05078004...	0.6459948841702...	-1.320407646306...	-40.54051257607...	

1 to 100 of 533

SQLite 3.7.5 Gecko 8.0 0.7.7 Exclusive Number of files in selected directory: 13 ET: 5 ms

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

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File Edit View History Bookmarks Tools Help

SQLite Manager - /home/researchtools/class/26/2011_194_S250A_Stbd_subsampled.sbet.sqlite

Database Table Index View Trigger Tools Help

Directory (Select Profile Database) Go

2011_194_S250...

Structure Browse & Search Execute SQL DB Settings

Enter SQL **Select | Data Manipulation | Create/Alter | Drop | ReIndex | PRAGMA**

SELECT * FROM sbet_entry LIMIT 10;

Run SQL Actions Last Error: not an error

time	y	x	z	x_vel
273498.00614401186	0.6457603284400583	-1.3208297029032352	-40.45023614456568	
273598.00912020274	0.6458430783179088	-1.3207610522130293	-40.74643455925252	
273698.0120963937	0.6459067550324421	-1.3207096018559352	-40.606438689825154	
273798.0150725846	0.6459302950668164	-1.3206870294277895	-40.619516001312604	
273898.0180477878	0.6459436114147666	-1.3206725653264602	-40.35614336623303	
273998.02102299087	0.6459559756437966	-1.3206541670776755	-40.47689076454981	
274098.0239991818	0.6459965800701406	-1.320592209382539	-40.75224789663025	
274198.02697537275	0.6460433879478653	-1.32053161107379	-40.56629224302651	
274298.0299505758	0.6460898905975295	-1.320533187988589	-40.68743343158485	
274398.0329267668	0.6460836679115416	-1.3206022851564592	-40.64719842078375	

SQLite 3.7.5 Gecko 8.0 0.7.7 Exclusive Number of Rows Returned: 10 ET: 0 ms

Wrote /home/researchtools/class/26/sbet.py

researchtools@ubuntu: ~/class/26

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File Edit View History Bookmarks Tools Help

SQLite Manager - /home/researchtools/class/26/2011_194_S250A_Stbd_subsampled.sbet.sqlite

Database Table Index View Trigger Tools Help

Directory (Select Profile Database) Go

2011_194_S250...

Structure Browse & Search Execute SQL DB Settings

Enter SQL **Select | Data Manipulation | Create/Alter | Drop | ReIndex | PRAGMA**

SELECT x,y FROM sbet_entry LIMIT 10;

Run SQL Actions Last Error: not an error

x	y
-1.3208297029032352	0.6457603284400583
-1.3207610522130293	0.6458430783179088
-1.3207096018559352	0.6459067550324421
-1.3206870294277895	0.6459302950668164
-1.3206725653264602	0.6459436114147666
-1.3206541670776755	0.6459559756437966
-1.320592209382539	0.6459965800701406
-1.32053161107379	0.6460433879478653
-1.320533187988589	0.6460898905975295
-1.3206022851564592	0.6460836679115416

SQLite 3.7.5 Gecko 8.0 0.7.7 Exclusive Number of Rows Returned: 10 ET: 0 ms

Wrote /home/researchtools/class/26/sbet.py