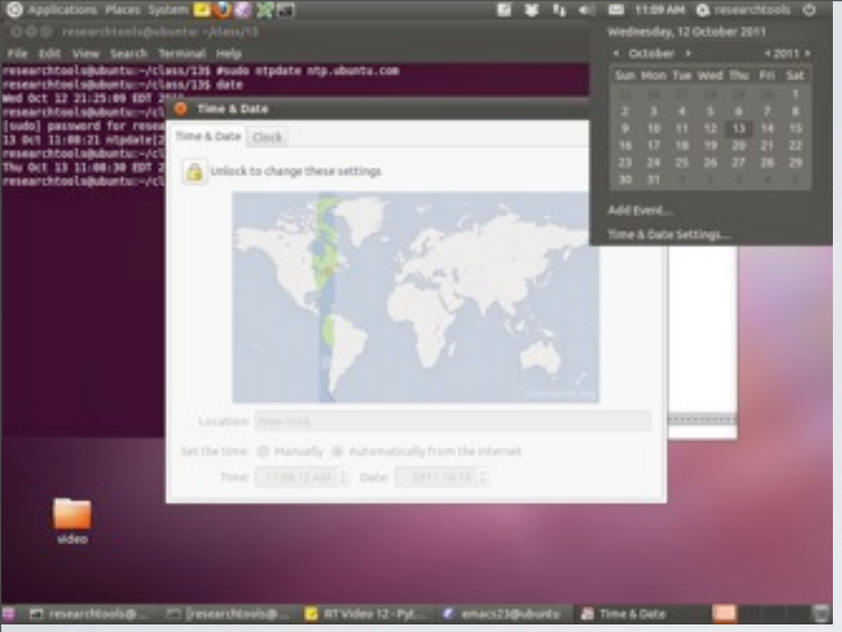
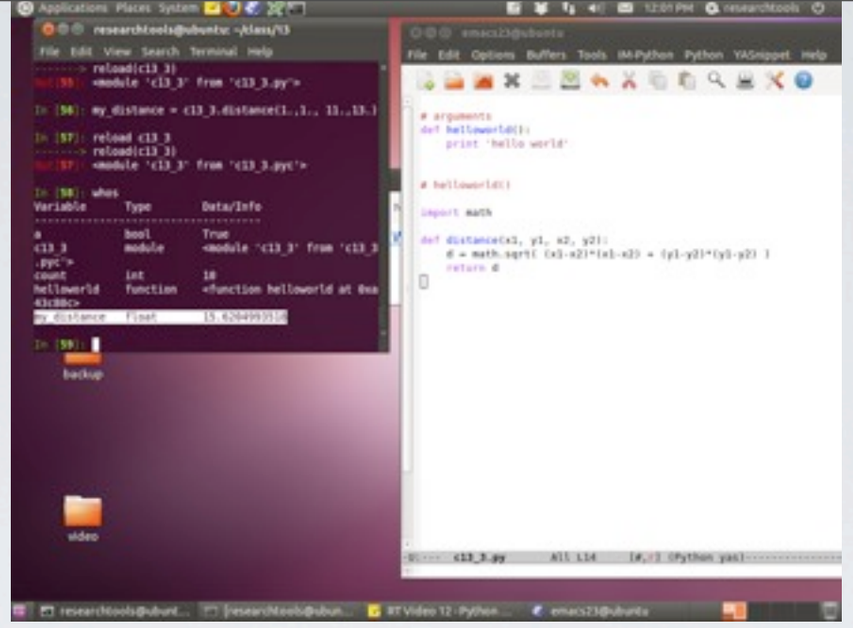
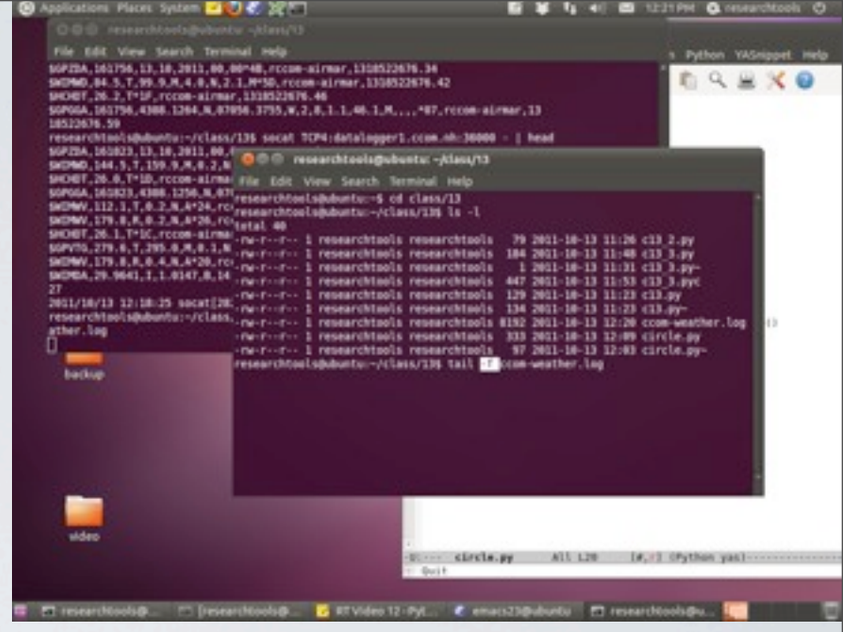




RESEARCH TOOLS 2011
LECTURE 13

2011-Oct-13

Kurt Schwehr
http://schwehr.org

UNH CCOM/JHC

Python: if, while, functions, classes

CC BY NC SA

http://vislab-ccom.unh.edu/~schwehr/Classes/2011/esci895-researchtools/
http://creativecommons.org/licenses/by-nc-sa/3.0/

Applications Places System 9:25 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
researchtools@ubuntu:~/class/13$ #sudo ntpdate ntp.ubuntu.com
researchtools@ubuntu:~/class/13$ date
Wed Oct 12 21:25:09 EDT 2011
researchtools@ubuntu:~/class/13$ sudo ntpdate ntp.ubuntu.com
[sudo] password for researchtools:
13 Oct 11:08:21 ntpdate[24935]: step time server 91.189.94.4 offset 49376.061513 sec
researchtools@ubuntu:~/class/13$ date
Thu Oct 13 11:08:30 EDT 2011
researchtools@ubuntu:~/class/13$
```

video

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:09 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
researchtools@ubuntu:~/class/13$ #sudo ntpdate ntp.ubuntu.com
researchtools@ubuntu:~/class/13$ date
Wed Oct 12 21:25:09 EDT 2011
researchtools@ubuntu:~/cl
[sudo] password for resea
13 Oct 11:08:21 ntpdate[2
researchtools@ubuntu:~/cl
Thu Oct 13 11:08:30 EDT 2
researchtools@ubuntu:~/cl
```

Wednesday, 12 October 2011

October 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Add Event...

Time & Date Settings...

Time & Date

Time & Date | Clock

Unlock to change these settings

Location: New York

Set the time: Manually Automatically from the Internet

Time: 11:09:12 AM Date: 2011-10-13

video

researchtools@... [researchtools@... RT Video 12 - Pyt... emacs23@ubuntu Time & Date

Applications Places System 11:12 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
Thu Oct 13 11:08:30 EDT 2011
researchtools@ubuntu:~/class/13$ traceroute
::1             ff02::1         ip6-allrouters  ip6-loopback    ubuntu
fe00::0         ff02::2         ip6-localhost   ip6-mcastprefix
ff00::0         ip6-allnodes    ip6-localnet    localhost
researchtools@ubuntu:~/class/13$ traceroute ntp.ubuntu.com
The program 'traceroute' is currently not installed.  You can install it by typing:
sudo apt-get install traceroute
researchtools@ubuntu:~/class/13$ ping ntp.ubuntu.com
PING ntp.ubuntu.com (91.189.94.4) 56(84) bytes of data.
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=1 ttl=128 time=81.5 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=2 ttl=128 time=80.7 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=3 ttl=128 time=82.7 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=4 ttl=128 time=81.5 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=5 ttl=128 time=81.0 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=6 ttl=128 time=80.9 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=7 ttl=128 time=81.1 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=8 ttl=128 time=82.0 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=9 ttl=128 time=80.8 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=10 ttl=128 time=80.0 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=11 ttl=128 time=80.3 ms
64 bytes from europium.canonical.com (91.189.94.4): icmp_req=12 ttl=128 time=80.4 ms
^C
--- ntp.ubuntu.com ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11022ms
rtt min/avg/max/mdev = 80.060/81.122/82.733/0.734 ms
researchtools@ubuntu:~/class/13$
```

```
                                                                [11:10]
` berrya hminami mohammad
lton tnguyen Gmasetti mluke



                                                                [11:11]

sed connection
nhresearchtools
unhresearchtools
                                                                [11:12]
```

Ubuntu H

```
-U:**-  #unhresearchtools@Unknown    All L18    (ERC)--------------------------------
```

researchtools@... [researchtools@... RT Video 12 - Pyt... emacs23@ubuntu Ubuntu Start Pag...

Applications Places System 11:15 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
researchtools@ubuntu:~/class/13$ ipython --pylab
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.

  Welcome to pylab, a matplotlib-based Python environment.
  For more information, type 'help(pylab)'.

In [1]: True
Out[1]: True

In [2]: False
Out[2]: False

In [3]: type(True)
Out[3]: <type 'bool'>

In [4]: type(False)
Out[4]: <type 'bool'>

In [5]:
```

[11:10]
` berrya hminami mohammad
lton tnguyen Gmasetti mluke

[11:11]
sed connection
nhresearchtools
unhresearchtools

[11:12]

video

-U:**- #unhresearchtools@Unknown All L19 (ERC)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:15 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
?         -> Introduction and overview of
%quickref -> Quick reference.
help      -> Python's own help system.
object?   -> Details about 'object'. ?obje

  Welcome to pylab, a matplotlib-based Pyt
  For more information, type 'help(pylab)'

In [1]: True
Out[1]: True

In [2]: False
Out[2]: False

In [3]: type(True)
Out[3]: <type 'bool'>

In [4]: type(False)
Out[4]: <type 'bool'>

In [5]: 1==1
Out[5]: True

In [6]: 1!=1
Out[6]: False

In [7]:
```

video

emacs23@ubuntu

File Edit Options Buffers Tools ERC Help

kurtvm on #unhresearchtools (+,lag:0)

```
[Thu Oct 13 2011]
*** You have joined channel #unhresearchtools                    [11:10]
*** Users on #unhresearchtools: kurtvm cenglert ben` berrya hminami mohammad
    matt_w nhassan kjerram sthein ahyde prasadh bwelton tnguyen Gmasetti mluke
    @ygh2
*** #unhresearchtools modes: +
<cenglert> morning everyone
<kurtvm> good morning
<ahyde> morning                                                  [11:11]
<kurtvm> sudo ntpdate ntp.ubuntu.com
*** ben` (~user@192.168.17.71) has quit: Client closed connection
*** ben (~user@192.168.17.71) has joined channel #unhresearchtools
*** ben` (~user@192.168.17.71) has joined channel #unhresearchtools
<kjerram> Good morning, folks...                                 [11:12]
<matt_w> hi

[Thu Oct 13 2011]
*** You have joined channel #unhresearchtools                    [11:15]
*** Users on #unhresearchtools: kurtvm ben` ben cenglert berrya hminami
    mohammad matt_w nhassan kjerram sthein ahyde prasadh bwelton tnguyen
    Gmasetti
*** #unhresearchtools modes: +
ERC>
```

-U:**- #unhresearchtools@Unknown All L26 (ERC)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:16 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
In [6]: 1!=1
Out[6]: False

In [7]: True or False
Out[7]: True

In [8]: True and False
Out[8]: False

In [9]: a = True

In [10]: who
Out[10]: <function who at 0x9c0f64c>

In [11]: %who
a

In [12]: %whos
Variable   Type    Data/Info
---------------------------
a          bool    True

In [13]: 'hi' == 'class'
Out[13]: False

In [14]:
```

```
                                                    [11:10]
` berrya hminami mohammad
lton tnguyen Gmasetti mluke



                                                    [11:11]

sed connection
nhresearchtools
unhresearchtools
                                                    [11:12]


                                                    [11:15]
glert berrya hminami
asadh bwelton tnguyen

*** #unhresearchtools modes: +
ERC>
-U:**-  #unhresearchtools@Unknown    All L26    (ERC)----------
```

video

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Thursday, October 13, 11

Applications Places System 11:17 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
In [14]: 4 < 5
Out[14]: True

In [15]: 4 > 5
Out[15]: False

In [16]: 4 >= 5
Out[16]: False

In [17]: 5 >= 5
Out[17]: True

In [18]: if True:
   ....:     print 'yes'
   ....:
   ....:
yes

In [19]: if False:
   ....:     print 'yes'
   ....:
   ....:

In [20]: if True:
   ....:     print 'yes'
   ....: els
```

```
                                                    [11:10]
` berrya hminami mohammad
lton tnguyen Gmasetti mluke



                                                    [11:11]

sed connection
nhresearchtools
unhresearchtools
                                                    [11:12]



                                                    [11:15]
glert berrya hminami
asadh bwelton tnguyen

*** #unhresearchtools modes: +
*** cenglert (~chatzill@lab8.ccom.nh) has quit: Ping timeout: 20 seconds
                                                    [11:17]
*** ben (~user@192.168.17.71) has quit: Client closed connection
*** ben` (~user@192.168.17.71) has quit: Client closed connection
ERC>

-U:**-  #unhresearchtools@Unknown    All L30    (ERC)--------------------------------
```

video

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Thursday, October 13, 11

Applications Places System 11:20 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
In [20]: if True:
    ....:     print 'yes'
    ....: else:
    ....:     print 'no'
    ....:
    ....:
yes

In [21]: if False:
    print 'yes'
else:
    print 'no'
    ....:
    ....:
no

In [25]: 'GGA' is 'AIGGA,84848484848'
Out[25]: False

In [26]: 'GGA' in 'AIGGA,84848484848'
Out[26]: True

In [27]: if 3 in [2,4,5,6]:
    ....:     print 'found'
    ....:
```

[11:12]

[11:15]

glert berrya hminami
asadh bwelton tnguyen

g timeout: 20 seconds

[11:17]

ed connection
sed connection

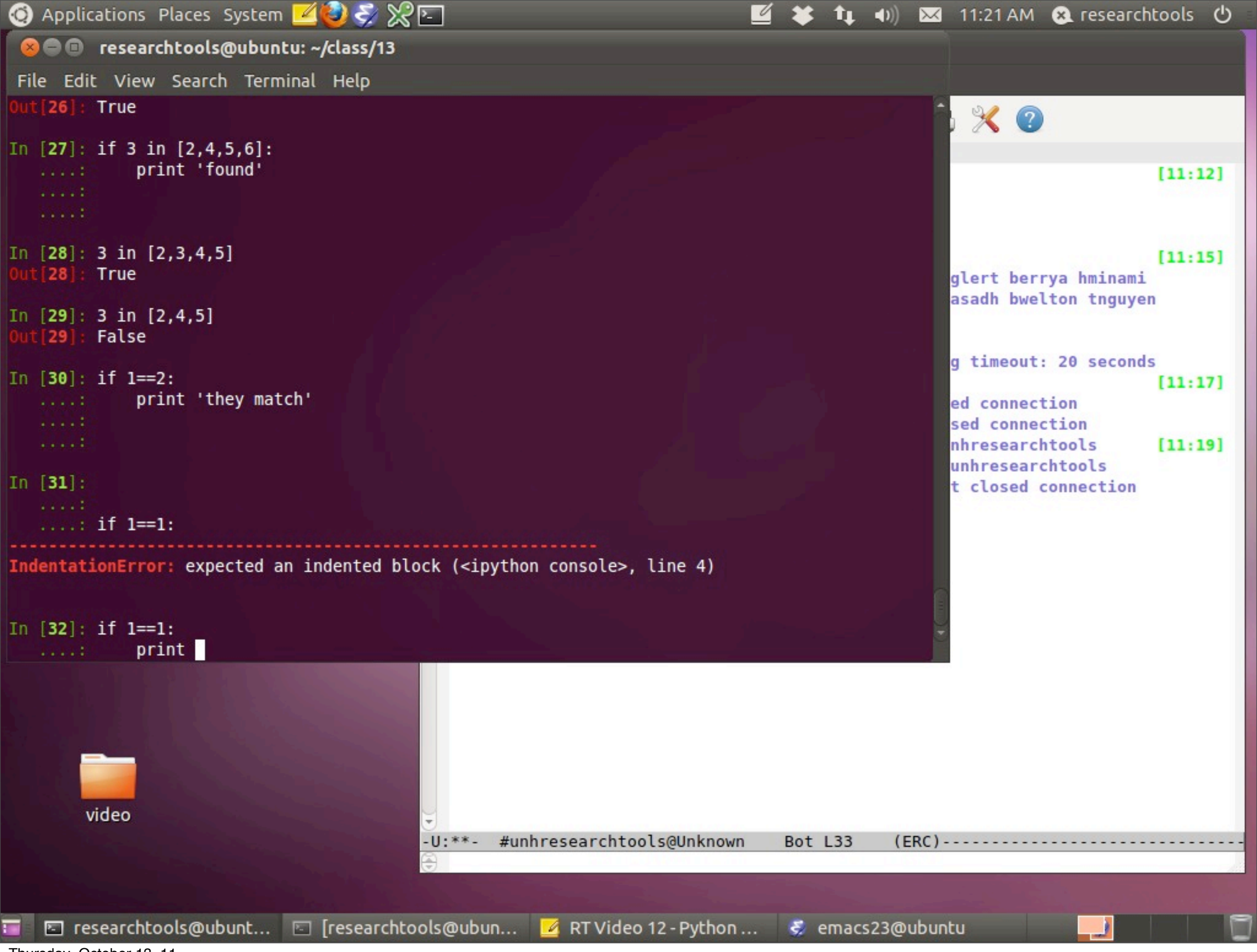
[11:19]

nhresearchtools
unhresearchtools
t closed connection

video

-U:**- #unhresearchtools@Unknown Bot L33 (ERC)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu


Applications Places System
11:21 AM
researchtools
researchtools@ubuntu: ~/class/13
File Edit View Search Terminal Help
Out[26]: True
In [27]: if 3 in [2,4,5,6]:
....: print 'found'
In [28]: 3 in [2,3,4,5]
Out[28]: True
In [29]: 3 in [2,4,5]
Out[29]: False
In [30]: if 1==2:
....: print 'they match'
In [31]:
....: if 1==1:
IndentationError: expected an indented block (<ipython console>, line 4)
In [32]: if 1==1:
....: print
[11:12]
[11:15]
glert berrya hminami
asadh bwelton tnguyen
g timeout: 20 seconds
[11:17]
ed connection
sed connection
nhresearchtools
[11:19]
unhresearchtools
t closed connection
video
-U:**- #unhresearchtools@Unknown Bot L33 (ERC)
researchtools@ubunt...
[researchtools@ubun...
RT Video 12 - Python ...
emacs23@ubuntu

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
they match

In [33]: pwd
Out[33]: '/home/researchtools/class/13'

In [34]: ls
c13.py

In [35]: run c13
case 3
---------------------------------------------------------------------------
NameError

/home/researchtools/class/13/c13.py in <mo
     10     print 'default at the end'
     11
---> 12 case
     13
     14

NameError: name 'case' is not defined
WARNING: Failure executing file: <c13.py>

In [36]: run c13
case 3

In [37]:
```

video

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
if False:
    print 'case 1'
elif 1==2:
    print 'case 2'
elif 2==2:
    print 'case 3'
else:
    print 'default at the end'
```

-U:--- c13.py All L12 [#,r] (Python yas)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:26 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
     14

NameError: name 'case' is not defined
WARNING: Failure executing file: <c13.py>

In [36]: run c13
case 3

In [37]: count = 0

In [38]: while count < 10:
   ....:     print 'count:', count
   ....:     count = count + 1
   ....:
   ....:
count: 0
count: 1
count: 2
count: 3
count: 4
count: 5
count: 6
count: 7
count: 8
count: 9

In [39]:
```

video

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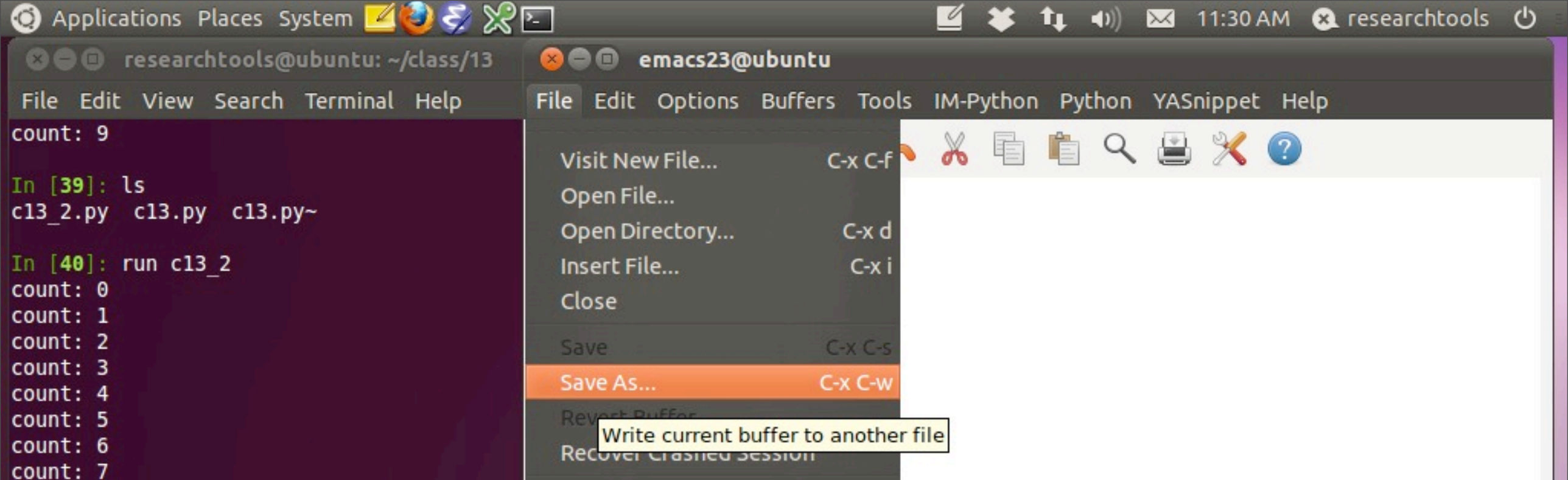
File Edit Options Buffers Tools IM-Python Python YASnippet Help

-U:--- **c13_2.py** All L1 [#,r] (Python yas)----------

Using the CPython shell

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu


Applications Places System
11:30 AM researchtools
researchtools@ubuntu: ~/class/13
File Edit View Search Terminal Help
count: 9
In [39]: ls
c13_2.py c13.py c13.py~
In [40]: run c13_2
count: 0
count: 1
count: 2
count: 3
count: 4
count: 5
count: 6
count: 7
count: 8
count: 9
In [41]: for count in range(10):
....:
....:
....:
KeyboardInterrupt
In [41]: pwd
Out[42]: '/home/researchtools/class/13'
In [43]:
video
emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
Visit New File... C-x C-f
Open File...
Open Directory... C-x d
Insert File... C-x i
Close
Save C-x C-s
Save As... C-x C-w
Revert Buffer
Write current buffer to another file
Recover Crashed Session
Print Buffer
Print Region
Postscript Print Buffer
Postscript Print Region
Postscript Print Buffer (B+W)
Postscript Print Region (B+W)
Split Window C-x 2
Remove Splits C-x 1
New Frame C-x 5 2
New Frame on Display...
Delete Frame C-x 5 0
Quit C-x C-c
-U:--- c13_2.py All L6 [#,r] (Python yas)
Quit
researchtools@ubunt...
[researchtools@ubun...
RT Video 12 - Python ...
emacs23@ubuntu

Applications Places System 11:32 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
In [39]: ls
c13_2.py  c13.py  c13.py~

In [40]: run c13_2
count: 0
count: 1
count: 2
count: 3
count: 4
count: 5
count: 6
count: 7
count: 8
count: 9

In [41]: for count in range(10):
   ....:
   ....:
   ....:
KeyboardInterrupt

In [41]: pwd
Out[42]: '/home/researchtools/class/13'

In [43]: run c13_3

In [44]:
```

video

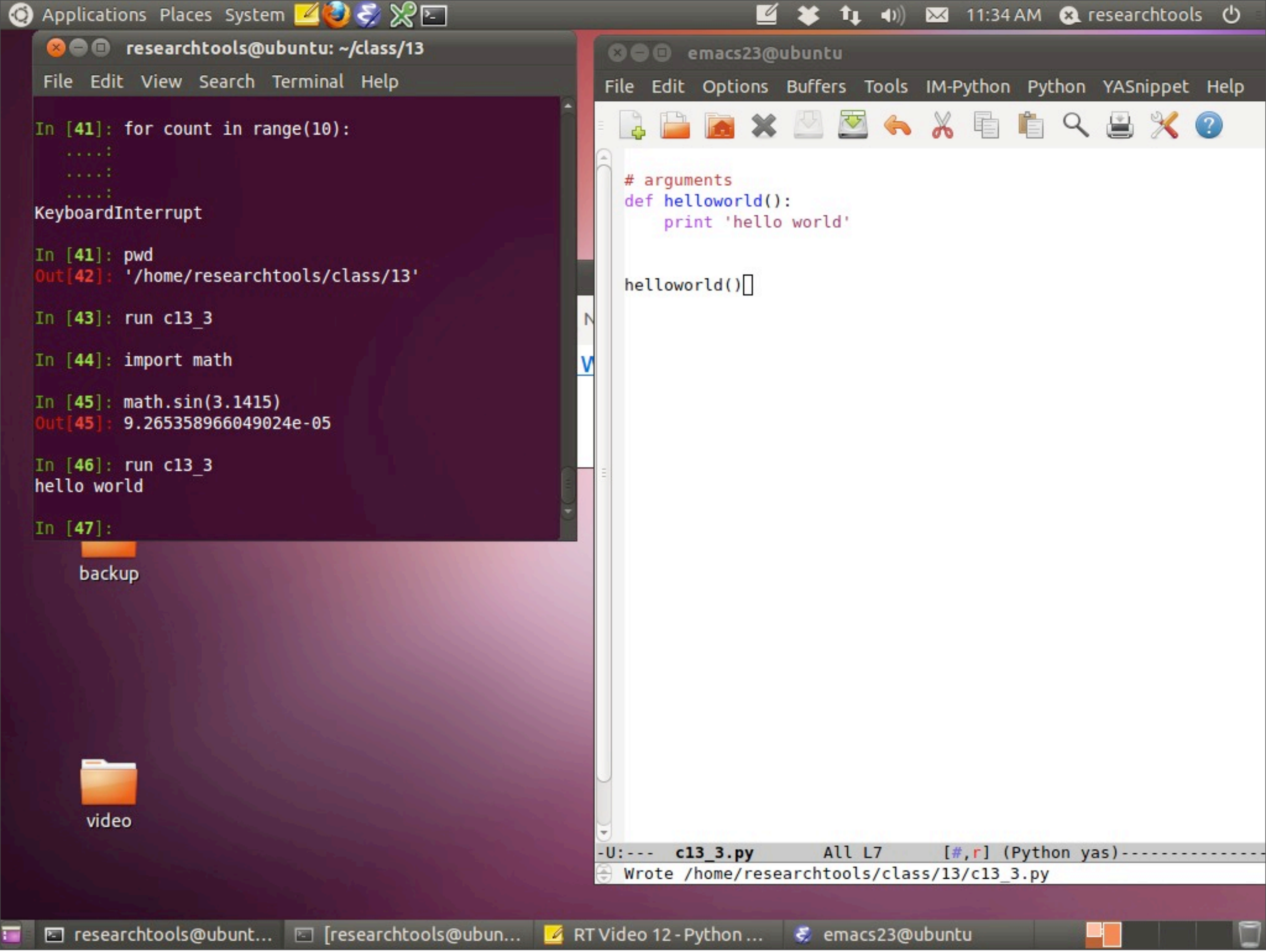
emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
# arguments
def helloworld():
    print 'hello world'
```

-U:--- c13_3.py All L5 [#,r] (Python yas)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu


Applications Places System
11:34 AM
researchtools
researchtools@ubuntu: ~/class/13
File Edit View Search Terminal Help
In [41]: for count in range(10):
....:
....:
....:
KeyboardInterrupt
In [41]: pwd
Out[42]: '/home/researchtools/class/13'
In [43]: run c13_3
In [44]: import math
In [45]: math.sin(3.1415)
Out[45]: 9.265358966049024e-05
In [46]: run c13_3
hello world
In [47]:
backup
video
emacs23@ubuntu
File Edit Options Buffers Tools IM-Python Python YASnippet Help
# arguments
def helloworld():
print 'hello world'
helloworld()
-U:--- c13_3.py All L7 [#,r] (Python yas)
Wrote /home/researchtools/class/13/c13_3.py
researchtools@ubunt...
[researchtools@ubun...
RT Video 12 - Python ...
emacs23@ubuntu

Applications Places System 11:43 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
    Return the square root of x.


In [48]: import c13_3

In [49]: c13_3.
c13_3.__builtins__      c13_3.__reduce__
c13_3.__class__         c13_3.__reduce_ex__
c13_3.__delattr__       c13_3.__repr__
c13_3.__dict__          c13_3.__setattr__
c13_3.__doc__           c13_3.__sizeof__
c13_3.__file__          c13_3.__str__
c13_3.__format__        c13_3.__subclasshook__
c13_3.__getattribute__  c13_3.distance
c13_3.__hash__          c13_3.helloworld
c13_3.__init__          c13_3.math
c13_3.__name__          c13_3.py
c13_3.__new__           c13_3.pyc
c13_3.__package__       c13_3.py~

In [49]: c13_3.
```

backup

video

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
# arguments
def helloworld():
    print 'hello world'


# helloworld()

import math

def distance(x1, y1, x2, y2):
    d = math.sqrt( (x1-x2)*(x1-x2) + (y1-y2)*(y1-y2) )
    return d
```

-U:--- **c13_3.py** All L14 [#,r] (Python yas)----------

Wrote /home/researchtools/class/13/c13_3.py

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:46 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
c13_3.__doc__               c13_3.__sizeof__
c13_3.__file__              c13_3.__str__
c13_3.__format__            c13_3.__subclasshook__
c13_3.__getattribute__      c13_3.distance
c13_3.__hash__              c13_3.helloworld
c13_3.__init__              c13_3.math
c13_3.__name__              c13_3.py
c13_3.__new__               c13_3.pyc
c13_3.__package__           c13_3.py~

In [49]: c13_3.distance(1,1, 11,13)
Out[49]: 15.620499351813308

In [50]: reload c13_3
-------> reload(c13_3)
Out[50]: <module 'c13_3' from 'c13_3.py'>

In [51]: c13_3.distance(1,1, 11,13)
15.6204993518

In [52]:
```

backup

video

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
# arguments
def helloworld():
    print 'hello world'


# helloworld()

import math

def distance(x1, y1, x2, y2):
    d = math.sqrt( (x1-x2)*(x1-x2) + (y1-y2)*(y1-y2) )
    print d
```

-U:--- **c13_3.py** All L13 [#,r] (Python yas)----------

Wrote /home/researchtools/class/13/c13_3.py

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 11:53 AM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
In [53]: my_distance = c13_3.distance(1.,1., 11.,13.)

15.6204993518

In [54]: whos
Variable      Type        Data/Info
-----------------------------------
a             bool        True
c13_3         module      <module 'c13_3' from 'c13_3
.py'>
count         int         10
helloworld    function    <function helloworld at 0xa
43c80c>
my_distance   NoneType    None

In [55]: reload c13_3
-------> reload(c13_3)
Out[55]: <module 'c13_3' from 'c13_3.py'>

In [56]:
```

backup

video

emacs23@ubuntu

File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
# arguments
def helloworld():
    print 'hello world'


# helloworld()

import math

def distance(x1, y1, x2, y2):
    d = math.sqrt( (x1-x2)*(x1-x2) + (y1-y2)*(y1-y2) )
    return d
```

-U:--- c13_3.py All L14 [#,r] (Python yas)----------

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 12:01 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
-------> reload(c13_3)
Out[55]: <module 'c13_3' from 'c13_3.py'>

In [56]: my_distance = c13_3.distance(1.,1., 11.,13.)

In [57]: reload c13_3
-------> reload(c13_3)
Out[57]: <module 'c13_3' from 'c13_3.pyc'>

In [58]: whos
Variable      Type        Data/Info
---------------------------------
a             bool        True
c13_3         module      <module 'c13_3' from 'c13_3
.pyc'>
count         int         10
helloworld    function    <function helloworld at 0xa
43c80c>
my_distance   float       15.6204993518

In [59]:
```

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```
# arguments
def helloworld():
    print 'hello world'


# helloworld()

import math

def distance(x1, y1, x2, y2):
    d = math.sqrt( (x1-x2)*(x1-x2) + (y1-y2)*(y1-y2) )
    return d
```

-U:--- c13_3.py All L14 [#,r] (Python yas)----------

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```
In [56]: my_distance = c13_3.distance(1.,1., 11.,13.)

In [57]: reload c13_3
-------> reload(c13_3)
Out[57]: <module 'c13_3' from 'c13_3.pyc'>

In [58]: whos
Variable      Type        Data/Info
-----------------------------------
a             bool        True
c13_3         module      <module 'c13_3' from 'c13_3
.pyc'>
count         int         10
helloworld    function    <function helloworld at 0xa
43c80c>
my_distance   float       15.6204993518

In [59]: run circle.py
23.34

In [60]:
```

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
class Circle(object):
    def __init__(self,a_radius):
        self.radius = a_radius


my_circle = Circle(23.34)

print my_circle.radius
```

-U:--- circle.py All L9 [#,r] (Python yas)----------

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researchtools@ubuntu: ~/class/13

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```
In [56]: my_distance = c13_3.distance(1.,1., 11.,13.)

In [57]: reload c13_3
-------> reload(c13_3)
Out[57]: <module 'c13_3' from 'c13_3.pyc'>

In [58]: whos
Variable      Type        Data/Info
-----------------------------------
a             bool        True
c13_3         module      <module 'c13_3' from 'c13_3
.pyc'>
count         int         10
helloworld    function    <function helloworld at 0xa
43c80c>
my_distance   float       15.6204993518

In [59]: run circle.py
23.34

In [60]:
```

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
class Circle(object):
    def __init__(self,a_radius):
        self.radius = a_radius

    def area(self):
        # area = 2 pi r^2
        return 2 * math.pi * r * r


my_circle = Circle(23.34)

print my_circle.radius, 'has area of', my_circle.area()
```

-U:**- circle.py All L8 [#,r] (Python yas)----------

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researchtools@ubuntu: ~/class/13

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```
---> 13 print my_circle.radius, 'has area of', my_c
cle.area()
     14
     15

/home/researchtools/class/13/circle.py in area(self
      6     def area(self):
      7         # area = 2 pi r^2
      8
----> 8         return 2 * math.pi * r * r
      9
     10

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


In [61]: run circle
23.34 has area of 3422.80038192

In [62]:
```

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
import math

class Circle(object):
    def __init__(self,a_radius):
        self.radius = a_radius

    def area(self):
        # area = 2 pi r^2
        r = self.radius
        return 2 * math.pi * r * r


my_circle = Circle(23.34)

print my_circle.radius, 'has area of', my_circle.area()
```

-U:--- circle.py All L10 [#,r] (Python yas)----------

Wrote /home/researchtools/class/13/circle.py

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Applications Places System 12:14 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
/home/researchtools/class/13/circle.py in area(self
      6     def area(self):
      7         # area = 2 pi r^2
      8
----> 8         return 2 * math.pi * r * r
      9
     10

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


In [61]: run circle
23.34 has area of 3422.80038192

In [62]:
Do you really want to exit ([y]/n)? n

In [63]: exit()
Do you really want to exit ([y]/n)? y
researchtools@ubuntu:~/class/13$
```

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File Edit Options Buffers Tools IM-Python Python YASnippet Help

```
import math

class Circle(object):
    def __init__(self,a_radius):
        self.radius = a_radius
        # self.area =

    def area(self):
        # area = 2 pi r^2
        r = self.radius
        return  2 * math.pi * r * r


my_circle = Circle(23.34)

print my_circle.radius, 'has area of', my_circle.area()
```

-U:--- circle.py All L20 [#,r] (Python yas)----------

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Applications Places System 12:15 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
Do you really want to exit ([y]/n)? n

In [63]: exit()
Do you really want to exit ([y]/n)? y
researchtools@ubuntu:~/class/13$ type socat
bash: type: socat: not found
researchtools@ubuntu:~/class/13$ socat
The program 'socat' is currently not installed.  You can install it by typin
g:
sudo apt-get install socat
researchtools@ubuntu:~/class/13$ sudo apt-get install socat
[sudo] password for researchtools:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  socat
0 upgraded, 1 newly installed, 0 to remove and 40 not upgraded.
Need to get 0 B/346 kB of archives.
After this operation, 950 kB of additional disk space will be used.
```

tu

ers Tools IM-Python Python YASnippet Help

```
:
f,a_radius):
= a_radius
=


i r^2
ius
math.pi * r * r


3.34)

us, 'has area of', my_circle.area()
```

-U:--- circle.py All L20 [#,r] (Python yas)----------

Quit

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Applications Places System 12:16 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
researchtools@ubuntu:~/class/13$ sudo apt-get install socat
[sudo] password for researchtools:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  socat
0 upgraded, 1 newly installed, 0 to remove and 40 not upgraded.
Need to get 0 B/346 kB of archives.
After this operation, 950 kB of additional disk space will be used.
Selecting previously deselected package socat.
(Reading database ... 241424 files and directories currently installed.)
Unpacking socat (from .../socat_1.7.1.3-1_i386.deb) ...
Processing triggers for man-db ...
Processing triggers for doc-base ...
Processing 1 added doc-base file(s)...
Registering documents with scrollkeeper...
Setting up socat (1.7.1.3-1) ...
researchtools@ubuntu:~/class/13$ type socat
socat is /usr/bin/socat
researchtools@ubuntu:~/class/13$
```

tu

ers Tools IM-Python Python YASnippet Help

```
:
f,a_radius):
= a_radius
=


i r^2
ius
math.pi * r * r


3.34)

us, 'has area of', my_circle.area()
```

-U:--- circle.py All L20 [#,r] (Python yas)----------

Quit

backup

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Applications Places System 12:17 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
[sudo] password for researchtools:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  socat
0 upgraded, 1 newly installed, 0 to remove and 40 not upgraded.
Need to get 0 B/346 kB of archives.
After this operation, 950 kB of additional disk space will be used.
Selecting previously deselected package socat.
(Reading database ... 241424 files and directories currently installed.)
Unpacking socat (from .../socat_1.7.1.3-1_i386.deb) ...
Processing triggers for man-db ...
Processing triggers for doc-base ...
Processing 1 added doc-base file(s)...
Registering documents with scrollkeeper...
Setting up socat (1.7.1.3-1) ...
researchtools@ubuntu:~/class/13$ type socat
socat is /usr/bin/socat
researchtools@ubuntu:~/class/13$ man socat
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 -
```

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tu

ers Tools IM-Python Python YASnippet Help

```
:
f,a_radius):
= a_radius
=


i r^2
ius
math.pi * r * r


3.34)

us, 'has area of', my_circle.area()
```

-U:--- circle.py All L20 [#,r] (Python yas)----------

Quit

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 12:18 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
$WIMDA,29.9670,I,1.0148,B,14.5,C,,,,,,,84.5,T,99.9,M,4.1,N,2.1,M*23,rccom-ai
rmar,1318522676.27
$GPZDA,161756,13,10,2011,00,00*4B,rccom-airmar,1318522676.34
$WIMWD,84.5,T,99.9,M,4.0,N,2.1,M*5D,rccom-airmar,1318522676.42
$HCHDT,26.2,T*1F,rccom-airmar,1318522676.46
$GPGGA,161756,4308.1264,N,07056.3755,W,2,8,1.1,46.1,M,,,,*07,rccom-airmar,13
18522676.59
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head
$GPZDA,161823,13,10,2011,00,00*46,rccom-airmar,1318522703.36
$WIMWD,144.5,T,159.9,M,0.2,N,0.1,M*59,rccom-airmar,1318522703.44
$HCHDT,26.0,T*1D,rccom-airmar,1318522703.47
$GPGGA,161823,4308.1256,N,07056.3759,W,2,8,1.1,44.9,M,,,,*0D,rccom-airmar,1318522703.61
$WIMWV,112.1,T,0.2,N,A*24,rccom-airmar,1318522703.66
$WIMWV,179.8,R,0.2,N,A*26,rccom-airmar,1318522703.71
$HCHDT,26.1,T*1C,rccom-airmar,1318522703.97
$GPVTG,279.6,T,295.0,M,0.1,N,0.1,K,D*22,rccom-airmar,1318522704.06
$WIMWV,179.8,R,0.4,N,A*20,rccom-airmar,1318522704.11
$WIMDA,29.9641,I,1.0147,B,14.4,C,,,,,,,191.5,T,206.9,M,0.3,N,0.2,M*29,rccom-airmar,1318522704.
27
2011/10/13 12:18:25 socat[28262] E write(1, 0x8ca57c0, 44): Broken pipe
researchtools@ubuntu:~/class/13$
```

backup

video

n Python YASnippet Help

```
my_circle.area()
```

```
-U:---  circle.py      All L20     [#,r] (Python yas)----------------
Quit
```

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
$GPZDA,161756,13,10,2011,00,00*4B,rccom-airmar,1318522676.34
$WIMWD,84.5,T,99.9,M,4.0,N,2.1,M*5D,rccom-airmar,1318522676.42
$HCHDT,26.2,T*1F,rccom-airmar,1318522676.46
$GPGGA,161756,4308.1264,N,07056.3755,W,2,8,1.1,46.1,M,,,,*07,rccom-airmar,13
18522676.59
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head
$GPZDA,161823,13,10,2011,00,00*46,rccom-airmar,1318522703.36
$WIMWD,144.5,T,159.9,M,0.2,N,0.1,M*59,rccom-airmar,1318522703.44
$HCHDT,26.0,T*1D,rccom-airmar,1318522703.47
$GPGGA,161823,4308.1256,N,07056.3759,W,2,8,1.1,44.9,M,,,,*0D,rccom-airmar,1318522703.61
$WIMWV,112.1,T,0.2,N,A*24,rccom-airmar,1318522703.66
$WIMWV,179.8,R,0.2,N,A*26,rccom-airmar,1318522703.71
$HCHDT,26.1,T*1C,rccom-airmar,1318522703.97
$GPVTG,279.6,T,295.0,M,0.1,N,0.1,K,D*22,rccom-airmar,1318522704.06
$WIMWV,179.8,R,0.4,N,A*20,rccom-airmar,1318522704.11
$WIMDA,29.9641,I,1.0147,B,14.4,C,,,,,,,191.5,T,206.9,M,0.3,N,0.2,M*29,rccom-airmar,1318522704.
27
2011/10/13 12:18:25 socat[28262] E write(1, 0x8ca57c0, 44): Broken pipe
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head -1000 > ccom-we
ather.log
```

n Python YASnippet Help

```
my_circle.area()
```

backup

video

-U:--- circle.py All L20 [#,r] (Python yas)----------

Quit

researchtools@ubunt... [researchtools@ubun... RT Video 12 - Python ... emacs23@ubuntu

Applications Places System 12:21 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
$GPZDA,161756,13,10,2011,00,00*4B,rccom-airmar,1318522676.34
$WIMWD,84.5,T,99.9,M,4.0,N,2.1,M*5D,rccom-airmar,1318522676.42
$HCHDT,26.2,T*1F,rccom-airmar,1318522676.46
$GPGGA,161756,4308.1264,N,07056.3755,W,2,8,1.1,46.1,M,,,,*07,rccom-airmar,13
18522676.59
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head
$GPZDA,161823,13,10,2011,00,0
$WIMWD,144.5,T,159.9,M,0.2,N
$HCHDT,26.0,T*1D,rccom-airma
$GPGGA,161823,4308.1256,N,07
$WIMWV,112.1,T,0.2,N,A*24,rc
$WIMWV,179.8,R,0.2,N,A*26,rc
$HCHDT,26.1,T*1C,rccom-airma
$GPVTG,279.6,T,295.0,M,0.1,N
$WIMWV,179.8,R,0.4,N,A*20,rc
$WIMDA,29.9641,I,1.0147,B,14
27
2011/10/13 12:18:25 socat[28
researchtools@ubuntu:~/class/
ather.log
```

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
researchtools@ubuntu:~$ cd class/13
researchtools@ubuntu:~/class/13$ ls -l
total 40
-rw-r--r-- 1 researchtools researchtools   79 2011-10-13 11:26 c13_2.py
-rw-r--r-- 1 researchtools researchtools  184 2011-10-13 11:48 c13_3.py
-rw-r--r-- 1 researchtools researchtools    1 2011-10-13 11:31 c13_3.py~
-rw-r--r-- 1 researchtools researchtools  447 2011-10-13 11:53 c13_3.pyc
-rw-r--r-- 1 researchtools researchtools  129 2011-10-13 11:23 c13.py
-rw-r--r-- 1 researchtools researchtools  134 2011-10-13 11:23 c13.py~
-rw-r--r-- 1 researchtools researchtools 8192 2011-10-13 12:20 ccom-weather.log
-rw-r--r-- 1 researchtools researchtools  333 2011-10-13 12:09 circle.py
-rw-r--r-- 1 researchtools researchtools   97 2011-10-13 12:03 circle.py~
researchtools@ubuntu:~/class/13$ tail -f ccom-weather.log
```

n Python YASnippet Help

backup

video

```
-U:---  circle.py      All L20     [#,r] (Python yas)----------------
Quit
```

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Applications Places System 12:22 PM researchtools

researchtools@ubuntu: ~/class/13

File Edit View Search Terminal Help

```
$HCHDT,26.2,T*1F,rccom-airmar,1318522676.46
$GPGGA,161756,4308.1264,N,07056.3755,W,2,8,1.1,46.1,M,,,,*07,rccom-airmar,13
18522676.59
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head
researchtools@ubuntu:~/class/13$ socat TCP4:datalogger1.ccom.nh:36000 - | head -1000 > ccom-weather.log
```

```
$WIMWV,216.4,R,1.0,N,A*23,rccom-airmar,1318522925.73
$HCHDT,25.5,T*1B,rccom-airmar,1318522925.99
$GPVTG,299.8,T,315.2,M,0.1,N,0.1,K,D*29,rccom-airmar,1318522926.07
$WIMWV,225.5,R,0.9,N,A*2A,rccom-airmar,1318522926.12
$WIMDA,29.9434,I,1.0140,B,14.6,C,,,,,,,248.1,T,263.5,M,0.8,N,0.4,M*2D,rccom-airm
ar,1318522926.29
$GPZDA,162206,13,10,2011,00,00*48,rccom-airmar,1318522926.37
$WIMWD,250.9,T,266.3,M,0.8,N,0.4,M*59,rccom-airmar,1318522926.45
$HCHDT,25.5,T*1B,rccom-airmar,1318522926.49
```

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video

-U:--- **circle.py** All L20 [#,r] (Python yas)----------

Quit

researchtools@... [researchtools@... RT Video 12 - Pyt... emacs23@ubuntu researchtools@u...