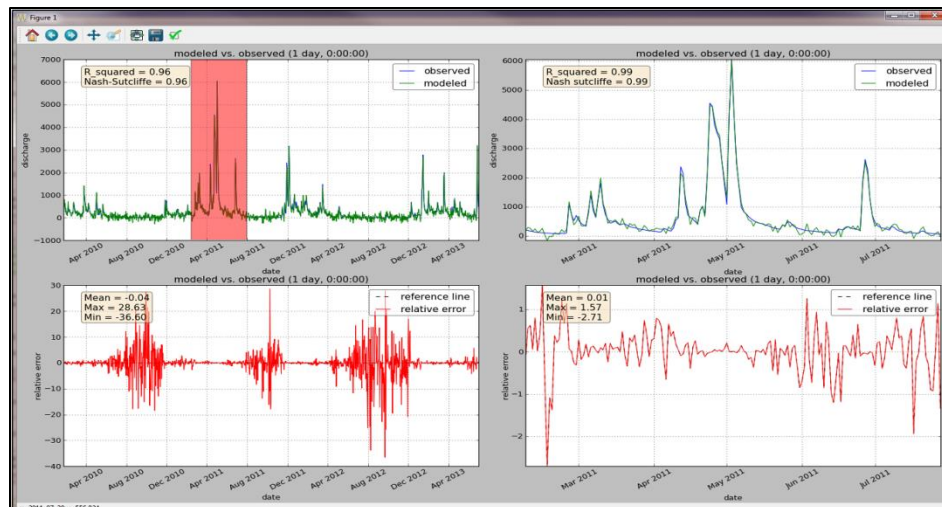
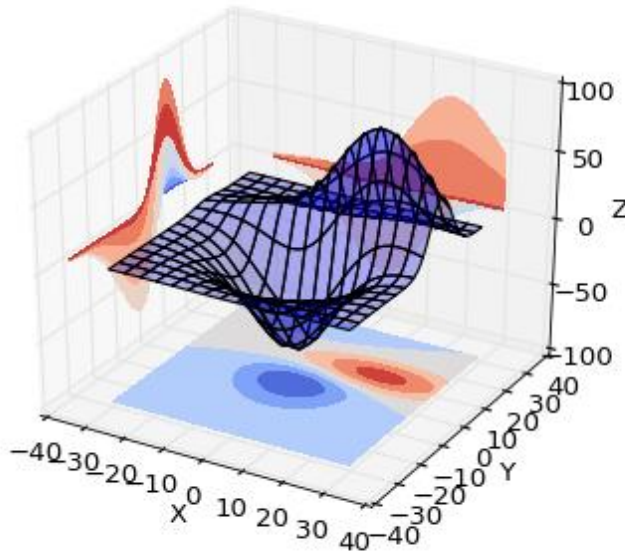


Introduction to Scientific Computing

Meeting 26

Programming with Python



```
# Write Fibonacci series up to n
>>> def fib(n):
>>>     a, b = 0, 1
>>>     while a < n:
>>>         print(a, end=' ')
>>>         a, b = b, a+b
>>>     print()
>>> fib(1000)
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610
```

Jeremiah Lant, Hydrologist
USGS Kentucky Water Science Center
jlant@usgs.gov

Last Meeting

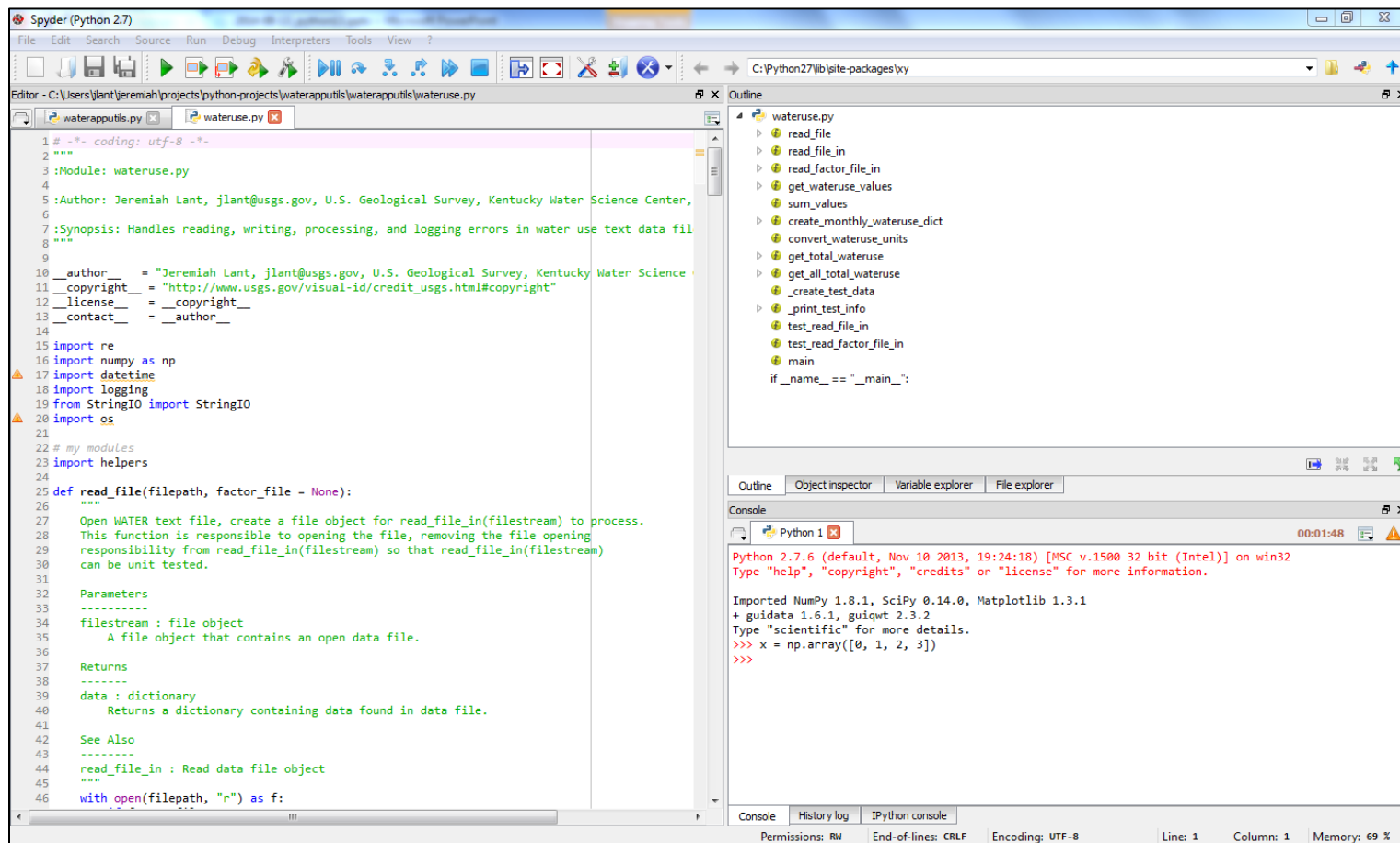
- Created a repo on Bitbucket or GitHub for a python script that reads and processes a sample data file.
- Started a python script to read a sample data file using `sys.argv` and display simple statistics to the screen.

Today's Objective

- Show Spyder IDE (Scientific Python Development Environment).
- Mention reorganization of GoogleDrive material and making a GitHub repo for the material.
- Talk about possibility of using GoogleDocs or Etherpad (<http://etherpad.org/>) to keep a record/log of meeting notes and questions.
- Continue to write a python script to read a sample data file using sys.argv and display simple statistics to the screen.

Spyder IDE

- Included with PythonXY (Windows) and Anaconda (cross-platform).



Reorganizing material on GoogleDrive and making a repo on GitHub

```
scientific-computing-group/  
  docs/  
    syllabus.txt  
  data/  
    *.txt  
  resources/  
    git/  
    python/  
  slides/  
    *.ppt  
  recordings/  
    *.wmv  
  code/  
    python/  
    bash-scripts/
```

```
scientific-computing-group/  
  docs/  
    syllabus.txt  
  meetings/  
    2014-08-13/  
  code/  
  data/  
  presentation/  
  recording/
```

Using GoogleDocs or Etherpad for meeting notes

The screenshot displays the Google Drive web interface. At the top, a notification states: "2014-08-13_python13.pptx" has been uploaded to the shared folder [meeting-26](#). The main content area shows the 'meeting-26' folder, which contains two files:

TITLE	OWNER	LAST MODIFIED
2014-08-13_python13.pptx Shared	me	11:46 am me
Meeting Notes Test Shared	me	11:01 am me


The left sidebar shows a folder hierarchy: meeting-10, meeting-11, meeting-12, meeting-13, meeting-14, meeting-15, meeting-16, meeting-17, meeting-18, meeting-19, meeting-20, meeting-21, meeting-22, meeting-23, meeting-24, meeting-25, **meeting-26**, syllabus, studying, and water-science-centers. At the bottom left, it indicates 7.43 GB (24%) of 30 GB used.

The right sidebar shows the 'ACTIVITY' panel for the 'meeting-26' folder. It lists recent activity:



































































- You moved an item to meeting-26: Meeting Notes Test (11:45 AM)
- You uploaded an item: 2014-08-13_python13.pptx (11:44 AM)
- You uploaded an item: meeting-26 (11:44 AM)

Below the activity list, it states: "No recorded activity before August 13, 2014".

Using GoogleDocs or Etherpad for meeting notes

etherpad

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B *I* U                                                                  

Challenge

Input

date	discharge (cfs)	stage (ft)	temperature (celsius)
01/05/2014	100	12.2	5
02/08/2014	110	12.8	3
03/07/2014	105	12.5	10
04/01/2014	98	11.9	20
05/04/2014	92	11.5	25
06/01/2014	104	12.3	28
07/02/2014	97	11.8	32
08/03/2014	95	11.7	33
09/04/2014	96	11.7	27
10/05/2014	101	12.0	20
11/02/2014	112	13.2	15
12/03/2014	109	12.8	7

2014_measurements_bob.txt

- Read file
- Parse data
- Print the following output:

filename

parameter_name

average: <value>

maximum: <value> occurred on <date>

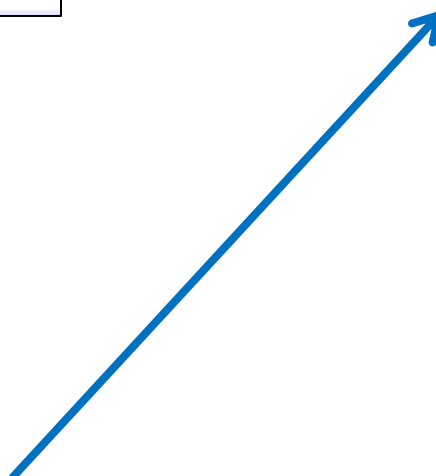
Output

```
$ python read_measurements.py 2014_measurements_bob.txt
2014_measurements_bob.txt

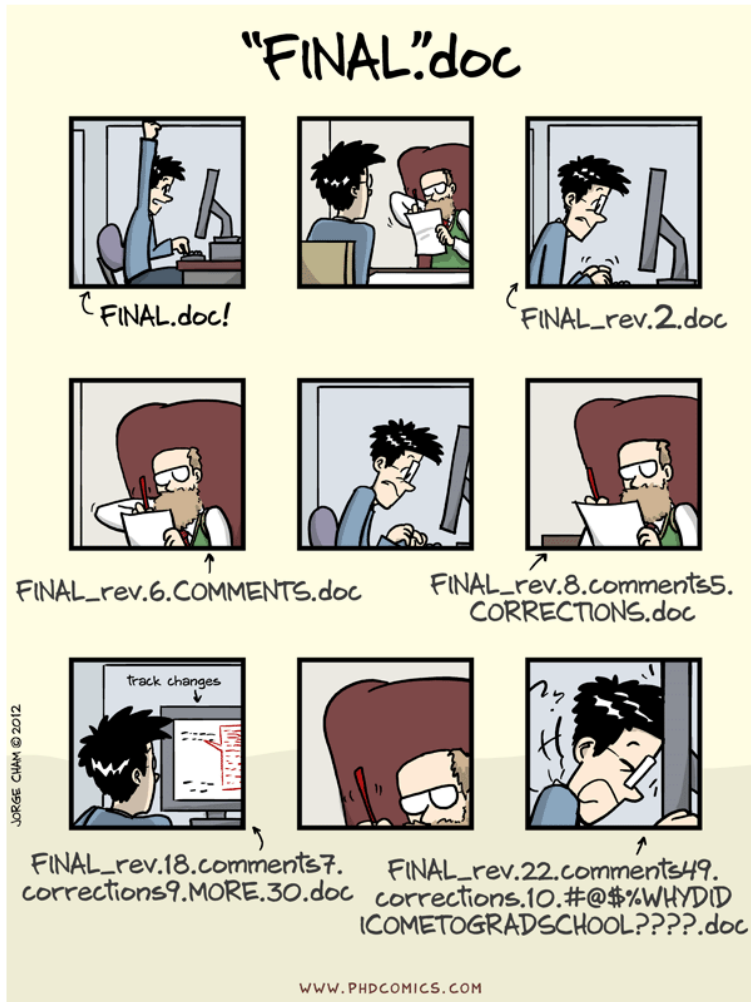
discharge (cfs):
  Average: 101.583
  Maximum: 112.0 occurred on 11/02/2014
  Minimum: 92.0 occurred on 05/04/2014

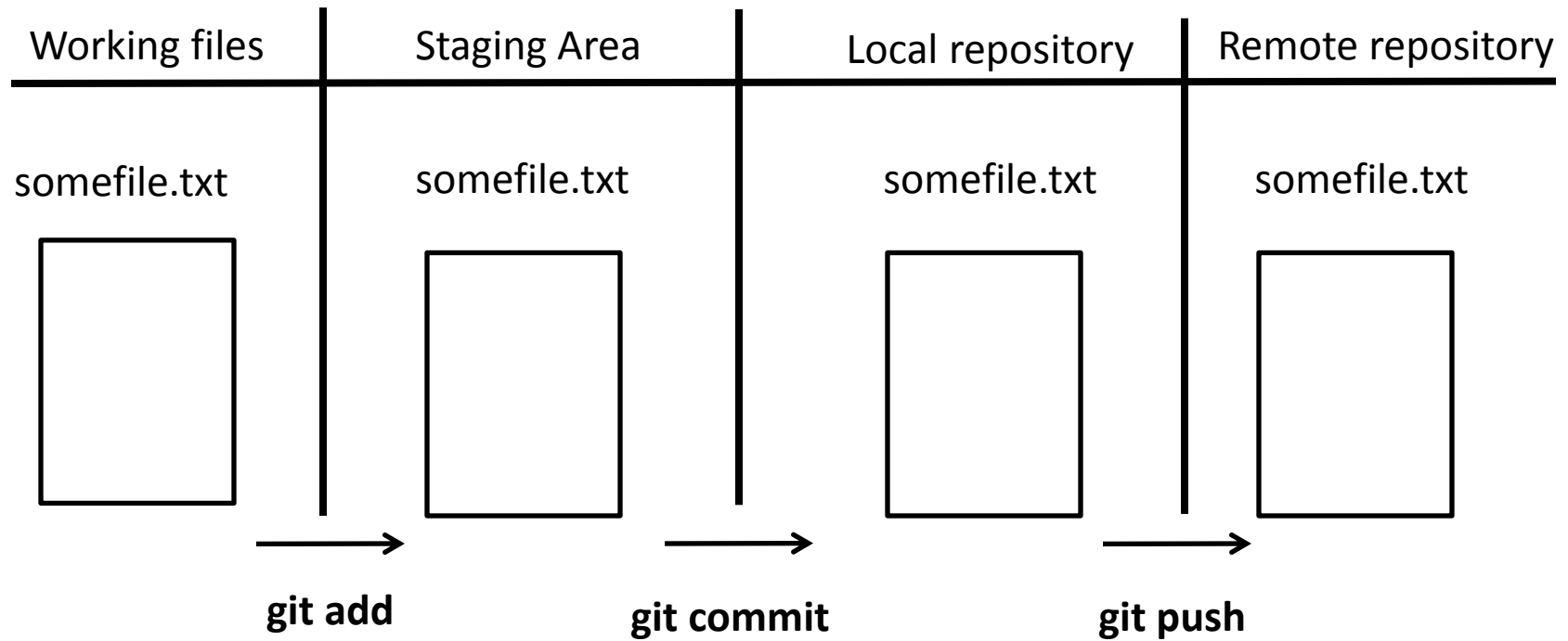
stage (ft):
  Average: 12.200
  Maximum: 13.2 occurred on 11/02/2014
  Minimum: 11.5 occurred on 05/04/2014

temperature (celsius):
  Average: 18.750
  Maximum: 33.0 occurred on 08/03/2014
  Minimum: 3.0 occurred on 02/08/2014
```

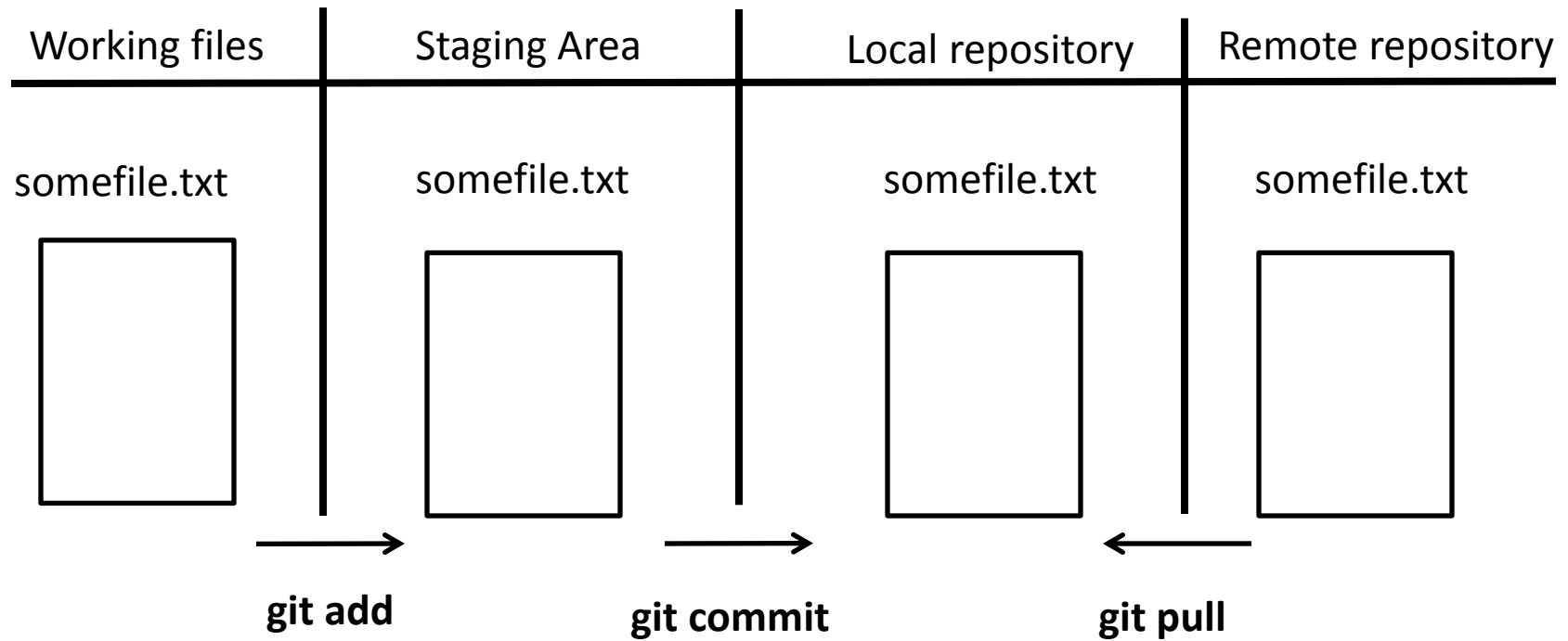


Recall Version Control with git





git



git

Commit these initial files

```
$ git status
```

```
$ git add .
```

```
$ git status
```

```
$ git commit -m "initial datafile and python file"
```

```
$ git status
```

```
$ git log
```

Your best friends:

git status

git add

git commit

git log

Let's start coding!

date	discharge (cfs)	stage (ft)	temperature (celsius)
01/05/2014	100	12.2	5
02/08/2014	110	12.8	3
03/07/2014	105	12.5	10
04/01/2014	98	11.9	20
05/04/2014	92	11.5	25
06/01/2014	104	12.3	28
07/02/2014	97	11.8	32
08/03/2014	95	11.7	33
09/04/2014	96	11.7	27
10/05/2014	101	12.0	20
11/02/2014	112	13.2	15
12/03/2014	109	12.8	7

```
$ python read_measurements.py 2014_measurements_bob.txt  
2014_measurements_bob.txt
```

```
discharge (cfs):
```

```
Average: 101.583
```

```
Maximum: 112.0 occurred on 11/02/2014
```

```
Minimum: 92.0 occurred on 05/04/2014
```

```
stage (ft):
```

```
Average: 12.200
```

```
Maximum: 13.2 occurred on 11/02/2014
```

```
Minimum: 11.5 occurred on 05/04/2014
```

```
temperature (celsius):
```

```
Average: 18.750
```

```
Maximum: 33.0 occurred on 08/03/2014
```

```
Minimum: 3.0 occurred on 02/08/2014
```