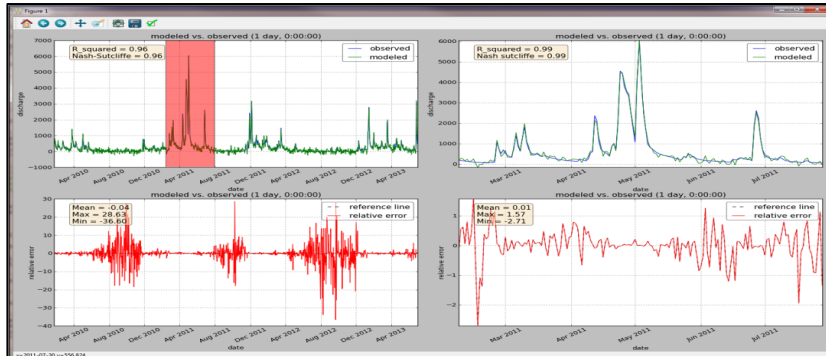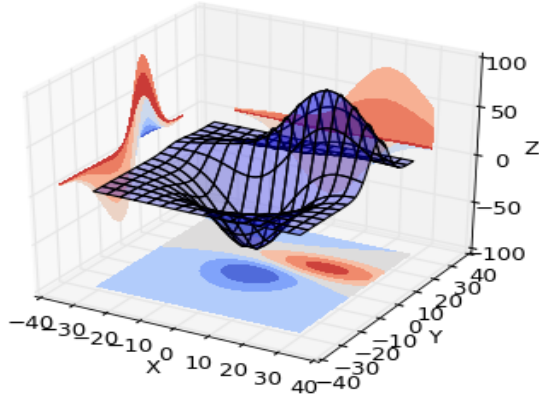# Scientific Computing Group
Programming with Python:
Read Measurements Project, Refactoring


```
# 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
```

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Review of notes and questions from last meeting

- Last meeting - started to refactor the read_measurements.py file to dynamically handle any order, number, or set of parameters in a measurements data file.
- https://github.com/jlant-usgs/scientific-computing-group

Today's Objectives

1. Continue to refactor the read_measurements.py file to dynamically handle any order, number, or set of parameters in a measurements data file.

Add ability to handle any **order**, number, or set of parameters

2014_measurements_bob.txt

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_alex.txt

date	stage (ft)	temperature (celsius)	discharge (cfs)
1/26/2014	12.9	6	105
2/24/2014	13.6	4	113
3/27/2014	13.3	11	108
4/21/2014	12.6	20	103
5/24/2014	12.0	25	97
6/21/2014	12.8	28	107
7/23/2014	12.4	32	98
8/28/2014	11.9	34	99
9/24/2014	11.9	27	101
10/23/2014	12.7	20	106
11/22/2014	13.4	16	115
12/28/2014	13.7	8	111

Currently, read_measurements.py can not read and process this file which has a different **order**.

Add ability to handle any order, **number**, or set of parameters

2014_measurements_bob.txt

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_tom.txt

date	discharge (cfs)	stage (ft)	temperature (celsius)	precipitation (in)
1/6/2014	107	13.2	3	0.22
2/8/2014	111	14.8	9	0.14
3/10/2014	111	14.5	11	0.79
4/11/2014	100	12.9	21	0.46
5/9/2014	99	13.5	27	0.98
6/12/2014	108	14.3	33	0.97
7/20/2014	101	13.8	38	0.74
8/15/2014	102	13.7	40	0.34
9/24/2014	99	13.7	35	0.53
10/8/2014	109	13.0	20	0.34
11/14/2014	120	14.2	14	0.82
12/16/2014	115	14.8	5	0.64

Currently, read_measurements.py can not read and process this file which has a different **number**.

Add ability to handle any order, number, or **set** of parameters

2014_measurements_bob.txt

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_kim.txt

date	dissolved oxygen (mg/liter)	pH (standard units)
1/17/2014	9.8	0.9
2/15/2014	9.6	1.1
3/12/2014	9.9	1.2
4/16/2014	10.1	1.3
5/14/2014	10.3	1.4
6/15/2014	11.2	1.6
7/17/2014	10.8	2.0
8/13/2014	10.5	1.9
9/16/2014	10.1	1.6
10/15/2014	9.8	1.3
11/14/2014	9.9	1.1
12/15/2014	9.7	1.2

Currently, read_measurements.py can not read and process this file which has a different **set**.

Next Meeting

- Refactor read_measurements.py with numpy arrays
- Plot data with matplotlib