More Summary Statistics

March 6, 2012

The Big Picture

Overall Goal

Build a Concordance of a text

- *Locations* of words
- *Frequency* of words

Today: Summary Statistics

- Review material from last class
- Count the number of words in Moby Dick
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- Get the vocabulary size of Moby Dick

Review: Types

- Integers

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- Floats

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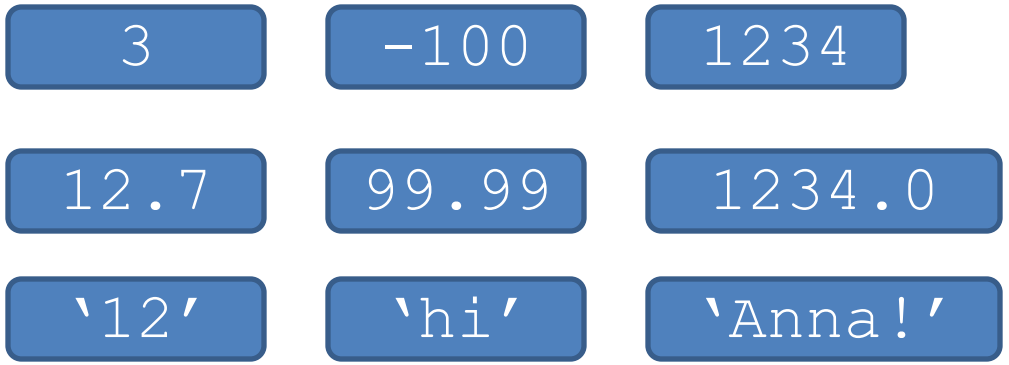
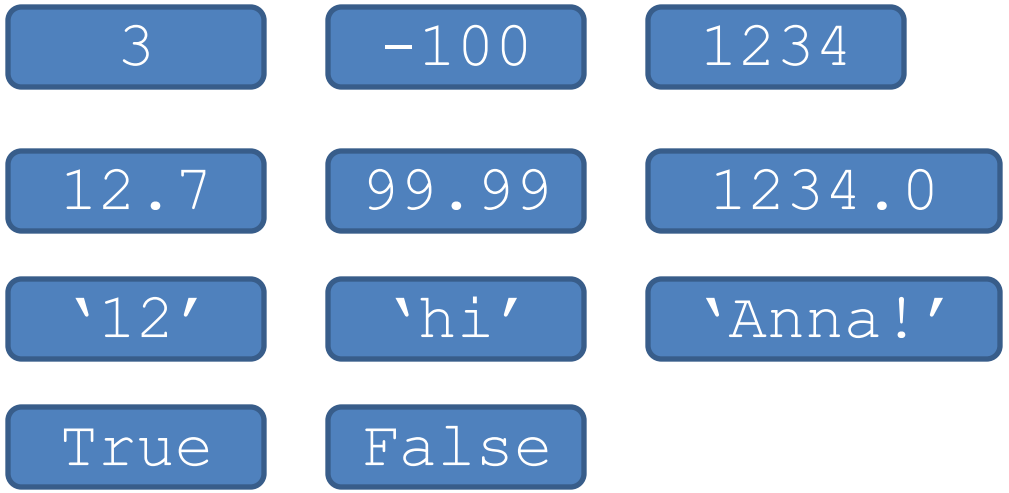
- Integers
- Floats
- Strings



Review: Types

- Integers
- Floats
- Strings
- Booleans



Review: Statements

- Expression Statements

Gives you output

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- Assignment Statements — *Stores* a value in a variable

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- `For` Statements — "For each element in `myList`, do something"

Review: Statements

- Expression Statements — Gives you output
- Assignment Statements — *Stores* a value in a variable
- `Print` Statements — Prints to the screen
- `For` Statements — "For each element in `myList`, do something"
- `If` Statements — If `A` is true, then do something, otherwise do something else

Review: Other Things

- Lists (a type of **data structure**)

```
[0,1,2]
['hi','there']
['hi',0.0]
[1,2,3,4,5,True,False,`true','one]
```

Review: Other Things

- Lists (a type of **data structure**)

```
[0,1,2]   ['hi','there']   ['hi',0.0]
[1,2,3,4,5,True,False,`true','one]
```

- Files (an **object** that we can open, read, close)

```
myFile = open(fileName,`r')
```

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Do Task 1

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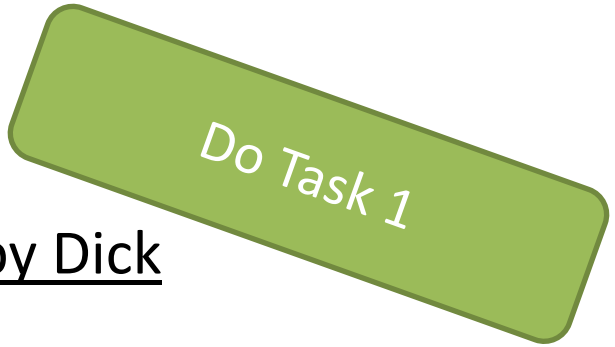

Python Functions

Preloaded Functions		
`len`	List OR String	Integer
`float`	Number (as an Integer, Float, or String)	Float
`int`	Number (as an Integer, Float, or String)	Integer
`str`	Integer, Float, String, or List	String
`range`	Two Integers 1. Start Index (Inclusive) 2. End Index (Exclusive)	List of Integers

These functions *cast* a variable of one type to another type

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Compute the Average Word Length of Moby Dick

```
def avgWordLengthInMobyDick():
    '''Gets the average word length in MobyDick.txt'''




    return avg
```

Compute the Average Word Length of Moby Dick

```
def avgWordLengthInMobyDick():
    '''Gets the average word length in MobyDick.txt'''
    myList = readMobyDick()
    s = 0
    for word in myList:
        s = s + len(word)
    avg = s/float(len(myList))
    return avg
```

Is our Program Accurate?

```
>>> MDList = readMobyDick()
>>> MDList[0:99]
['CHAPTER', '1', 'Loomings', 'Call', 'me', 'Ishmael.',
'Some', 'years', 'ago--never', 'mind', 'how', 'long',
'precisely--', 'having', 'little', 'or', 'no', 'money', 'in',
'my', 'purse,', 'and', 'nothing', 'particular', 'to',
'interest', 'me', 'on', 'shore,', 'I', 'thought', 'I',
'would', 'sail', 'about', 'a', 'little', 'and', 'see', 'the',
'watery', 'part', 'of', 'the', 'world.', 'It', 'is', 'a',
'way', 'I', 'have', 'of', 'driving', 'off', 'the', 'spleen',
'and', 'regulating', 'the', 'circulation.', 'Whenever', 'I',
'find', 'myself', 'growing', 'grim', 'about', 'the',
'mouth;', 'whenever', 'it', 'is', 'a', 'damp,', 'drizzly',
'November', 'in', 'my', 'soul;', 'whenever', 'I', 'find',
'myself', 'involuntarily', 'pausing', 'before', 'coffin',
'warehouses,', 'and', 'bringing', 'up', 'the', 'rear', 'of',
'every', 'funeral', 'I', 'meet;', 'and']
```

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Get the Longest Word in Moby Dick

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def getLongestWordInMobyDick():
    '''Returns the longest word in MobyDick.txt'''




    return longestword
```

Get the Longest Word in Moby Dick

```
def getLongestWordInMobyDick():
    '''Returns the longest word in MobyDick.txt'''
    myList = readMobyDick()
    longestword = ""
    for word in myList:
        if len(word) > len(longestword):
            longestword = word
    return longestword
```

Get the Longest Word in Moby Dick

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def getLongestWordInMobyDick():
    '''Returns the longest word in MobyDick.txt'''
    myList = readMobyDick()
    longestword = ""
    for word in myList:
        if len(word) > len(longestword):
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```
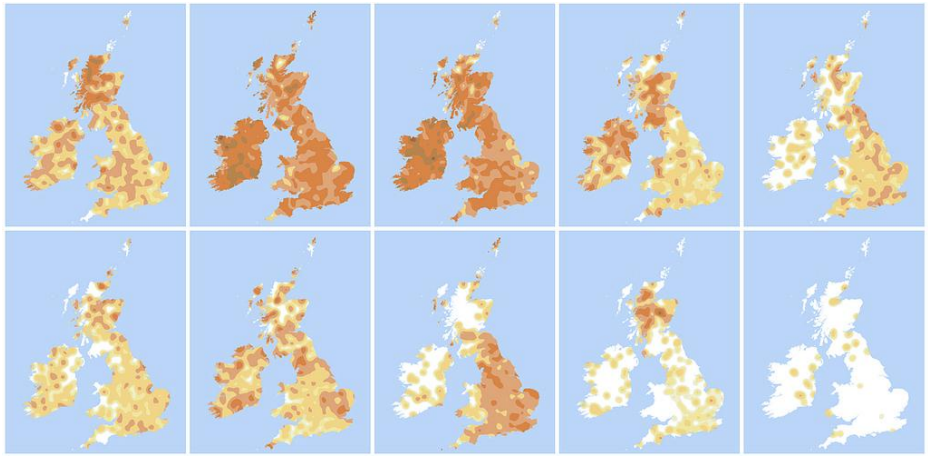
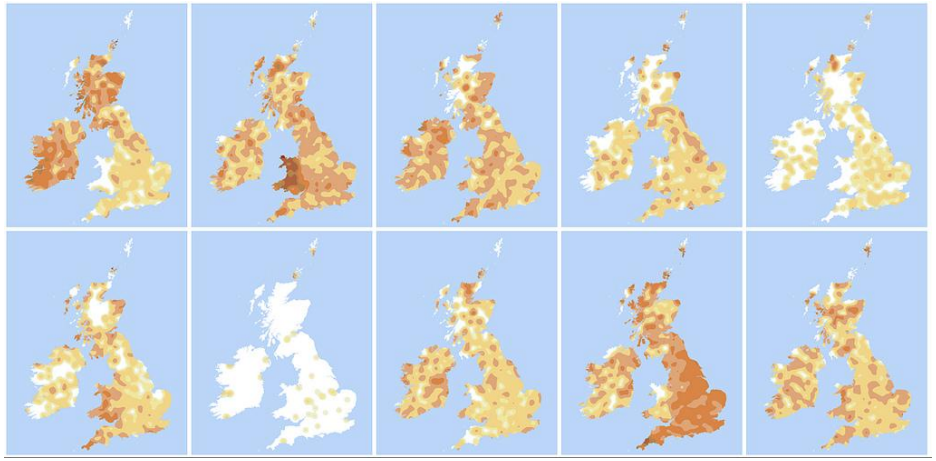
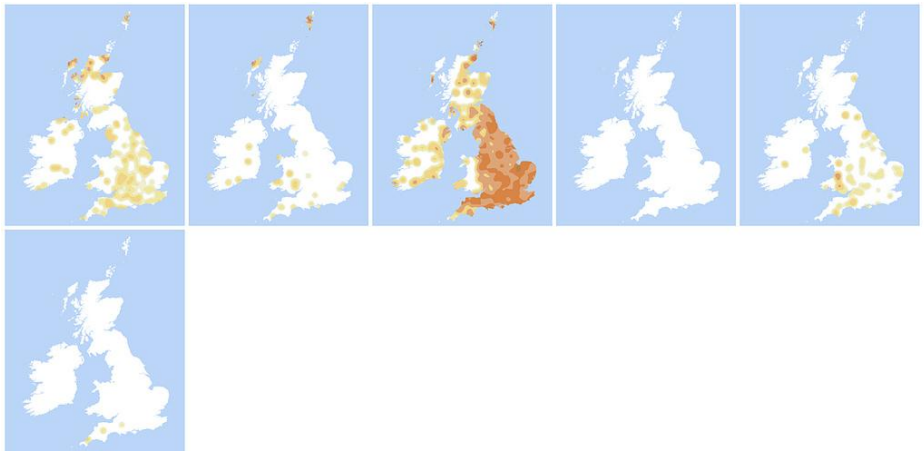

Is our program accurate?

Break





Alphabet Maps of the UK and Ireland (url on site)



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Boolean Expressions on Strings

Boolean Operators on Strings		
Operator	**Example**	**Result**
Equality	`'a' == 'b'`	`False`
Inequality	`'a' != 'b'`	`True`
Less Than	`'a' < 'b'`	`True`
Less Than or Equal To	`'a' <= 'b'`	`True`
Greater Than	`'a' > 'b'`	`False`
Greater Than or Equal To	`'a' >= 'b'`	`False`

Writing a `vocabSize` Function

```
def vocabSize():
    myList = readMobyDick()
    uniqueList = noReplicates()
    return len(uniquelist)
```

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```
def noReplicates(wordList):
    '''takes a list as
argument, returns a list free
of replicate items.  slow
implementation.'''
```

```
def isElementOf(myElement,myList):
    '''takes a string and a list
and returns True if the string is
in the list and False
otherwise.'''
```

What does `slow implementation` mean?

- Re-comment the lines and run `vocabSize()`
  - Hint: Ctrl-C (or Command-C) will abort the call.

What does `slow implementation` mean?

- Re-comment the lines and run `vocabSize()`
  - Hint: Ctrl-C (or Command-C) will abort the call.

- There's a *faster* way to write `noReplicates()`
  - What if we can sort the list?

```
['a','a','a','at','and','and',…,'zebra']
```

Python `For` Statements (For Loops)

"For each element in list myList, do something"

```
>>> myList = [1,2,3]
>>> for i in range(0,3):
        print myList[i]


1
2
3
>>>
```

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List
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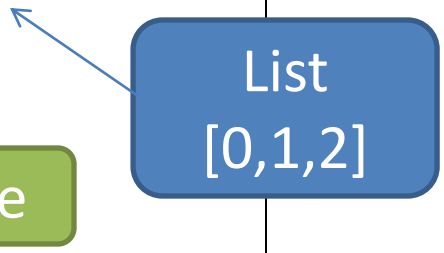

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List [0,1,2]

Variable

Q: What if we don't know the length of the list?

Python `For` Statements (For Loops)

"For each element in list myList, do something"

```
>>> myList = [1,2,3]
>>> for i in range(0,len(myList)):
        print myList[i]


1
2
3
>>>
```

List [0,1,2]

Variable

Q: What if we don't know the length of the list?

Python `For` Statements (For Loops)

"For each element in list myList, do something"

```
>>> def printList(list):
      for i in range(0,len(list)):
          print list[i]
      return
```

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