#TBT

- Finish some Python concepts and questions from earlier
  - Review for midterm exam

- Strategies for success in 101 assignments
  - Reading, writing, understanding, ... success!
  - Knowing when to ask for help when you’re feeling ...

## Counting Questions


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### Extreme Python, Extreme Values

- If I start reading a list of numbers ..... 
  - How do you remember the largest? 
  - What do you think or do when I say “572” ...

- Keep a variable storing extreme/max/min
  - Update when new/next value processed 
  - What do you initialize max/min to? 
  - What if you want the index as well as the value?

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### Find largest value in a list of ...

Max value: [1, 2, 3], ["zebra", "armadillo"]

- Does code below work for strings?

```python
maxval = 0
for val in lst:
    if val > maxval:
        maxval = val
return maxval
```

What about using `max(lst)` similar to `sum(lst)`
Find largest value in a list of...

```python
grades = ["owen:3.8", "bob:3.7", "susan:3.9"]

mname = 
mgpa = 0.0
for data in grades:
    parts = data.split(':')
    name = parts[0]
    gpa = float(parts[1])
    if gpa > mgpa:
        mgpa = gpa
        mname = name
return mname
```

How to approach a 101 Assignment

- Programming compared to Cooking
  - Follow a recipe to create [food or masterpiece]?
  - Understand the whole project before coding
  - Know at least a few steps before coding

What do we learn from assignment?

- We will snarf to get started
  - We will modify Pigify.py
  - We will create Caesar.py

- The grading tells us:
  - Caesar counts the same as Pigify
  - The chi-squared test will be difficult
  - The README will be worth more than normal

What does HowTo say about Pigify.py

- Lots of details on how to pigify a word
  - Ignore at first, make the structure of the program work

- We have to write four functions
  - Details on function headers/prototypes given
  - Details on function functionality given

- Types and values in main program
  - Work to understand the flow
  - Run the program, where do you start?
Making pigall work

- Make sure you understand this
  - What do you need to do so this works?
  - What is header, signature, prototype: pigword

```python
def pigall(st):
    all = []
    for word in st.split():
        all.append(pigword(word))
    return ''.join(all)
```

Making pigword work

- Once you know what pigword does, how do you implement it?
  - Review rules for piglatin
  - Review code for APT you hopefully did 😊

- Don’t try to make every case work at once!
  - Start small and grow a working program.
  - How about first word is a vowel to begin ...
  - Then add another case, ...

If pigword is done ... else ...

- Get to unpigall and unpigword
  - Which will be easy? Why?
  - Can you do one easy case in unpigword?

- Why does it help to do one case at a time?
  - Builds confidence in reaching completion
  - Decreases time-to-completion: code works! Bugs easier to find.

In class Questions

Cracking the Caesar Cipher

● First create Caesar.py
  ➢ Where do you start?
  ➢ What’s in the main program?
  ➢ What’s copied from Pigify.py

● What functions will you write first?
  ➢ Where do you find this information?
  ➢ What’s not clear about it?

Lots of details in making this work

● How do you loop over characters in word?
  ➢ Is there anything familiar here?

● How do you know if a character is
  ➢ Alphabetic?
  ➢ Uppercase or lowercase?
  ➢ A vowel or a consonant?

● Once again: start simple, make something work, add functionality incrementally

How do you know encryption works?

● Is this a chicken and egg question?
  ➢ Could you write decrypt first?
  ➢ Isn’t decrypting by eyeball decryption just encrypting 26 times?

Can you call a function 26 times?

● Encrypt using 26 shift keys and ... eyeball!

14 Pljbqjlp fsq bxpv ql zlrkq colj 1-10, yrq klq xitxvp
15 Qmkcrkqcr grq cyqw rm ansrl dpmlk 1-10, zsr lmr yjuywq
16 Rnlksldhc hs'rs dzrx sn bntms eqml 1-10, ats mns zkadx
17 Sometimes it’s easy to count from 1-10, but not always
18 Tpnfujnt ju’t fbtz up dpou gspn 1-10, cvu opu bmxbzt
19 Uqogvlogu kv’u geua vq eqwpv htoq 1-10, dwv pqv cnycau

Wllam Shakespeare
Grindower: I can call the spirits from the vaulty deep. Hotspur: Why, so can I, and so can any man: But will they come, when you do call for them?
What is chi-square about?

- If you expect [5, 9, 6, 11] then how close is?
  - [1, 9, 4, 8]
  - [4, 8, 9, 4]
  - [5, 5, 5, 5]

- What does $\sum (C_i - E_i)^2 / E_i$ mean?
  - $4^2/5 + 0^2/9 + 2^2/6 + 3^2/11 = 4.684$
  - $1^2/5 + 1^2/9 + 3^2/6 + 7^2/11 = 6.265$
  - $0^2/5 + 4^2/9 + 1^2/6 + 6^2/11 = 5.215$

- And the answer is ...