#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

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?
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:  # type of data
    if val > maxavl:  # initial maxval?
        maxval = val
return maxval
```

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

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

mname = ""
mgpa = 0.0
for data in grades:  # type of data
    parts = data.split(':')  # type of parts
    name = parts[0]
    gpa = float(parts[1])  # type of gpa
    if gpa > mgpa:  # initial 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?

14 Pljbqfjbp fq'p bxpv ql zlrkq colj 1-10, yrq klq xitxvp
15 Qmkcrgkcq gr'q cyqw rm amslr dpmk 1-10, zsr lmr yjuywq
16 Rnlshldr hs'r dzrx sn bntms eqnl 1-10, ats mns zkvvzx
17 Sometimes it's easy to count from 1-10, but not always
18 Tpnfujfft ju't fbtz up dpvou gspn 1-10, cvu opu bmxbzt
19 Uqogvkogu kv'u gcua vq eqwvpv htqo 1-10, dwv pqv cnycau
Can you call a function 26 times?

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

```python
em = '#encrypted message
for n in range(26):
    sem = encrypt(em,n)
print n,sem
```
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 $\sum \frac{(C_i - E_i)^2}{E_i}$ mean?
  - $\frac{4^2}{5} + \frac{0^2}{9} + \frac{2^2}{6} + \frac{3^2}{11} = 4.684$
  - $\frac{1^2}{5} + \frac{1^2}{9} + \frac{3^2}{6} + \frac{7^2}{11} = 6.265$
  - $\frac{0^2}{5} + \frac{4^2}{9} + \frac{1^2}{6} + \frac{6^2}{11} = 5.215$

- And the answer is ...