

# CSC 111:

# Intro to Computer Science through Programming

Spring 2017  
Prof. Sara Mathieson



# Admin

- + Homework 5 due Tues after spring break
- + Lab this week will be like TA hours (optional time to ask questions and work on homework/studying)
- + Pick up your practice midterm if you haven't done so already
- + Pick up a midterm study sheet if you haven't done so already
- + Office hours **TODAY 3-5pm in Ford 355**

# Midterm logistics recap

- + In the Nielson library starting Tuesday morning
- + Time limit: 2 hours
- + No phones, computers, book, notes, etc
- + No discussion of the exam with anyone else
- + You may use a cheat sheet (double sided), don't have to turn in
- + Please do not write on other sheets (backs of exam okay)
- + For code: do not worry about comments, variable names, perfect syntax

# Outline: 3/6

- + Lab 3 examples
- + Finish midterm review (emphasis on practice with Booleans)
- + While loops
- + Wednesday: start Graphics!




# Lab 3 Examples

(selected by Aditya)

# Lab 3 Feedback

```
def count(string, character):  
    n = len(string)  
  
    num_char = 0  
    for i in range(n):  
        if string[i] == character:  
            num_char = num_char + 1  
        else:  
            num_char = num_char
```

- 1) Reassign the count to itself (unnecessary) 
- 2) Angle passed to `math.sin(angle)` should be in radians
- 3) `random.randint(0, 3)` to go over `['A','C','G','T']`; use `len()` to make it more generic
- 4) In Part E, make sure that the unknown case is first

# Lab 3, Part E Example

```
# CSC 111, Lab 3, Part E
# Author: Hening Zheng and Maggie Carttar

#This program count how many bases are the same,
#how many are different,
#and how many are unknown

def main():
    human = "ATA?CAAGACCTCGTTATTAATACGGCGCCATGTGAGTAATCCTATC?GA"
    chimp = "ATAACAAGAGCTAGTTATTA?TACTGCGCCATGTGAGAAATCCTATAGGA"

    #variables all start at zero
    same = 0
    different = 0
    unknown = 0

    #calculate how many bases are unknown, same, different
    for i in range(len(human)):

        #unknown goes up by 1 if either or both human and chimp bases are "?"
        if human[i] == "?" or chimp[i] == "?":
            unknown = unknown + 1

        #same goes up by 1 if human and chimp bases are the same
        elif human[i] == chimp[i]:
            same = same + 1

        #different goes up by one if human and chimp bases are the different
        else:
            different = different + 1

    print(same, "bases are the same.")
    print(different, "bases are different.")
    print(unknown, "bases: either human or chimp or both unknown.")

main()
```

# Lab 3, Part E Example

```
# CSC 111, lab 3 E
# Authors: Deniz Keles and Blanca Martin

def main():
    human = "ATA?CAAGACCTCGTTATTAATACGGCGCCATGTGAGTAATCCTATC?GA"
    chimp = "ATAACAAGAGCTAGTTATTA?TACTGCGCCATGTGAGAAATCCTATAGGA"

    count_same = 0
    count_different = 0
    count_unknown = 0

    # for the length of the DNA sequence,
    # the loop compares the bases in human and chimps
    for i in range(len(human)):

        # If human/chimp or both are unknown
        if human[i] == '?' or chimp[i] == '?':
            count_unknown = count_unknown + 1

        # Looks for when the bases are different
        elif human[i] != chimp[i]:
            count_different = count_different + 1

        # Looks for when the bases are the same
        else:
            count_same = count_same + 1

    print(str(count_same), 'bases are the same.')
    print(str(count_different), 'bases are different.')
    print(str(count_unknown), 'bases: either human or chimp or both unknown.')

main()
```

# Midterm review

# Practice midterm feedback

## Part A (triangle name)

- 1) Cannot subtract strings the way we can add them using concatenate
- 2) Some people used one for loop with an if/else condition – this does work, but becomes more complicated and is harder to get right
- 3) Lots of hardcoding of the number (5, 4, etc) instead of using the variable number

# Practice midterm feedback

## Part A (triangle name)

- 1) Cannot subtract strings the way we can add them using concatenate
- 2) Some people used one for loop with an if/else condition – this does work, but becomes more complicated and is harder to get right
- 3) Lots of hardcoding of the number (5, 4, etc) instead of using the variable number

## Part B (palindrome)

- 1) Using `new_word` instead of calling `reverse(word)`
- 2) Indexing vs. going over the characters when using a for loop
- 3) `==` vs. `=`

# Palindrome square

```
def main():
    string = input("Enter a string: ")

    if palindrome(string):
        print("\n>> " + string, "is a palindrome\n")
        for i in range(len(string)):

            if i == 0 or i == len(string)-1:
                print(string)
            else:
                stars = "*" * (len(string)-2)
                print(string[i] + stars + string[i])

    else:
        print("\n>> " + string, "is not a palindrome\n")
        print(string + reverse(string))
```

Enter a string: hello

>> hello is not a palindrome

helloworld

Enter a string: tacocat

>> tacocat is a palindrome

```
tacocat
a*****a
c*****c
o*****o
c*****c
a*****a
tacocat
```



# Practice Midterm Exercise: Booleans

- + TODO: write a function to determine whether or not a string has a repeated letter

```
>>> repeated_letter("hello")
True
>>> repeated_letter("goodbye")
True
>>> repeated_letter("spring")
False
>>>
>>> repeated_letter("boolean")
True
>>> repeated_letter("fall")
True
>>> repeated_letter("break")
False
>>>
```

# Slicing recap: Lab 4

```
# selected tweets from President McCartney
tweet1 = "Great to see Northampton's growth and
         @MayorNarkewicz's leadership recognized!
         #ProudNeighbors"
tweet2 = "SGA, future leaders of the world,
         working hard for Smithies today
         @smithcollege #SmithiesLead"
tweet3 = "Gluten-free birthday lunch at Dawes.
         Thanks to Lisa and Raj, chefs extraordinaire
         @smithcollege #Yummy #GF"
tweet4 = "Northamptoners and Smith Notables
         sing Halo together to warm up at Silver
         Chord Bowl #HampArts"
tweet5 = "Shout out to January '17 grads
         @smithcollege #WomenForTheWorld
         #TheyAreReady #SmithiesLead"
```

Goal output:

```
>>>
ProudNeighbors
SmithiesLead
Yummy
GF
HampArts
WomenForTheWorld
TheyAreReady
SmithiesLead
>>>
```