CS 160
CS Orientation

Review & Programming w/ Turtle
Chap. 3, 5, and 6.2
Python Sequential Logic

print("_**_")
print("_***_")
print("_*****_")
print("_*******_")
Print Triangle w/ ifs

```python
if(1):    #This is the same as if(1==1) or if(True)
    print("   *")
if(1):
    print("  *** ")
if(-1):   #Any number other than 0 is true
    print("  ***** ")
if(0):
    print("********")
```

false
Python Loop Logic

for x in range(7):
    # When you want to do something a specific number of times, i.e. loop for n times

OR

x=1
while(x<=7):
    # When you want to do something while condition holds true, i.e. while the user wants to continue
    x+=1
Print Triangle w/ while

```python
tri = 0  # Create variable to hold which part of the triangle to print

while tri < 4:
    if tri == 0:
        print("    *")
        tri += 1  # Same as tri = tri + 1 to increment the variable
    elif tri == 1:
        print("   ***")
        tri += 1
    elif tri == 2:
        print("  *****")
        tri += 1
    elif tri == 3:
        print("********")
        tri += 1
```

# This would be my approach, so I can make bigger triangles quickly without changing this number everywhere in my program.

```
MAX_TRI = 8

for x in range(1, MAX_TRI, 2):
    for sp in range((MAX_TRI-x)//2):
        print(" ", end="")
    for sp in range(x):
        print("*", end="")
    for sp in range((MAX_TRI-x)//2):
        print(" ", end="")
    print(x)
```

know external source reflection sp

MAX_TRI
Problem Statement

• For all the employees in our company, calculate their gross pay based on their hours and pay rate.

```plaintext
prompt for # employees
read # employees & assign to var/num
for all employees
  prompt/read hours
  prompt/read pay
  print calculation of hours * pay
```
Python Demo

```python
employees = int(input("Enter num of employees: "))

for x in range(employees):
    hours = float(input("Enter Employee #"+str(x+1)+"'s hours: "))
    pay = float(input("Enter Employee #"+str(x+1)+"'s pay: "))
    print("Employee #"+str(x+1)+" has gross pay "+str(hours*pay))
```
Functions

- May need to import a library
- Use the function from library/object
- Example:
  ```python
  import math
  math.sqrt(4)
  ```
What is the purpose of a function?

• Perform some task!
  – May take input (arguments)
  – May **produce output** (cout)
  – May return a value (return statement)
  – May alter input (change argument values if mutable)

• Example: \( y = f(x) = 3 \times x \)
Python Function Syntax

```python
def func_to_define(possible_parameters):
    print("hello")
    possible_parameter = 3
    return "possible_str"
```

```python
a = 2
func_to_define(a)
```

Arguments $y = f(10)$
Turtle in Python

```python
import turtle

wn = turtle.Screen()  # Create object for window
my_turtle = turtle.Turtle()  # Create turtle object

my_turtle.shape("turtle")
my_turtle.color("blue")

wn.mainloop()  # Wait for user to close window
```
Mouse Click & Functions

```python
import turtle

# Define the function before calling the function
def drawsquare(x, y):    # You need these parameters for mouse click
    myturt.clear()
    for i in range(4):
        myturt.forward(100)
        myturt.left(90)

wn = turtle.Screen()
myturt = turtle.Turtle()

wn.bgcolor("yellow")
wn.title("Drawing a square")

myturt.shape("turtle")
myturt.onclick(drawsquare)    # Call the drawsquare function on mouse click

wn.mainloop()
```
Quiz #4

• Get into groups of 4-5 and write down your thoughts about Brian Apgar’s gaming talk.
  – What did you learn?
  – How did this change your perspective on Game Creation in CS?