We are going to practice writing Python code using conditionals. It builds on our knowledge of variables and operators from before.

Please make a copy of this Google Doc (File > Make a Copy) and fill in the answers below. Then, you can go to File > Download > pdf when you are done and **upload your answers to Canvas.**

Note: If you get stuck on this (or any) lab assignment, it is completely acceptable to 1) talk to a classmate and discuss what they think and 2) ask the instructor or CS tutor for help. See the syllabus for the appropriate email addresses if you are not doing this lab during the Thursday lab period. See also https://bit.ly/PixelPadDocs

1) [20 points] Using the starting template https://bit.ly/FruitFaceStarter, make a visual image in PixelPad.io. It should contain at least 4 elements using at least 3 different images. It should contain at least two interactive components, that is, the user should be able to press keys and see the image change in an interesting way. If you completed the Fruit Face activity in class Tuesday, you can submit that.

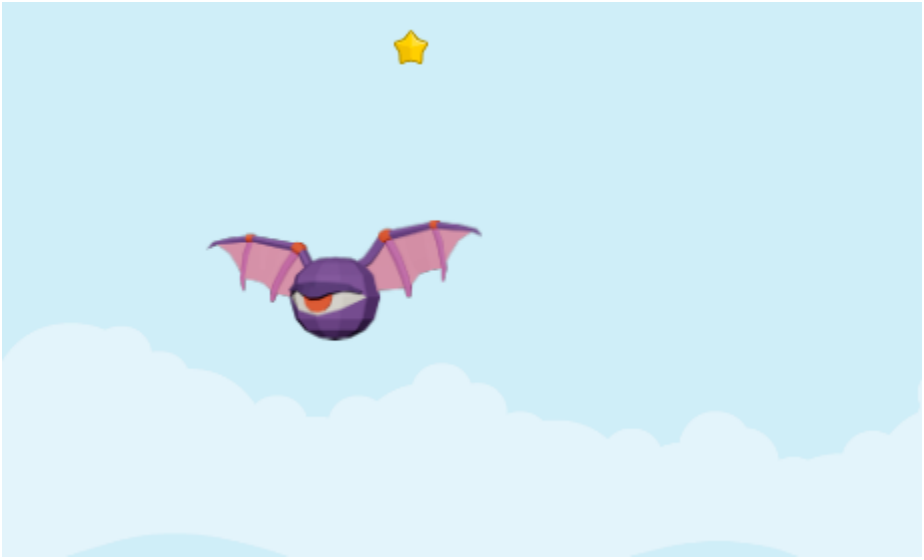
1a) [10 points] Paste the link from pixelpad.io that you made. Be sure to create an account first so you can save your work. If I cannot see your code, you get 0 points. Put your name in a comment near the top of the code.
https://pixelpad.io/app/nnbnjyngslp/?edit=1#

1b) [5 points] What are the names of the variables in your code? On which lines were those variables created? Which variables exist in Game Start and which exist the Game Loop?
apple.png,Watermelon.png,banana.png
Lines 9,10,11,and 12
Variables in game start: Watermelon.png,apple.png,banana Variables in game loop: apple_img.apple_img2, and banana_img

1c) [5 points] How many conditionals does your code have?[1] On which lines are they written? What do they do? 3 conditionals lines 6, 8, and 12 on line 6 the condition is if "S" is pressed the banana rotates, on line 8 if "G" is pressed the apples scale on line 12 if "R" is pressed both apples rotate

2) [20 points] Using the starting template https://bit.ly/PixelPadBase make an activity in PixelPad.io that involves moving an image, representing the player (e.g. a bat), around the screen using the arrow keys. You should have at least one other image, representing a target (e.g. a star), which appears in a random location on the screen and when the user moves the player into the target, the target should disappear and a message should be displayed to the user. Put another way, the player should be able to collect the target item.

The player should be able to move up left, right, down, and along all 4 diagonals using the arrow keys. The player should have two speeds, with the faster speed being turned on if the user holds a particular key while holding the arrow keys. If you completed the Bat Star activity in class Thursday, you can submit that.
Hint: As tempting as it is to use methods like `set_speed_x` or `accelerate_y`, they are not the right tools for the job. Those are if we want images to move on their own and not as a result of user input.



2a) [10 points] Paste the link from pixelpad.io that you made. Put your name in a comment near the top. https://pixelpad.io/app/ijestjuaaes/?edit=1#

2b) [5 points] How many conditionals does your code have? On which lines are they created? What do they do?
9
Line: 6,10,12,14,16,18,20,22,24
They make the bat move left right up and down, if the bat and coin collide the coin gets collected and you get a point

[1] If the true answer is 0, you will get 0 points on this question.

2c) [5 points] What problem would your code have if you changed some of the ifs to elifs? Assume the changes do not introduce syntax errors; I want to know what semantic issues the code would have.
The computer will get confused because elif statements are only meant for when conditions are not true and these conditions have nothing to do with true or false and the screen will say "Bad Input on line …"

2d) [bonus; 5 points] Add some code to make the target appear in a different, random, spot after it has been collected by the player, instead of disappearing. If you did this, explain which lines of code do this and how it works.

```
11 if have_collided(Bat,coin):
    12 print("you got a point!")
    13 coin.shift(rx,mv)
```

This works because a if statement was used so since the statement is true (the bat and coin collide) The coin is able to move around the screen because of the random.int function that was retrieved from the game start.

2e) [bonus; 10 points] Add some code to make the "fast" mode only work for 5 seconds before needing a 10 second "cooldown" before the fast mode can be used again. If you did this, explain which lines of code do this and how it works.

3) [20 points] In the previous lab, we made some tools to help someone with their geometry homework. Let's use conditionals to handle both the area and perimeter of a triangle or a square depending on what the user wants. video demo

3a) Write the python code that asks the user if they want to compute the area or perimeter. Then ask the user if they want to consider a square or triangle. Then, ask the user for either the length of one side (for a square) or the length of 3 sides (for a triangle). Finally, print out the calculated value. You must use this formula for computing the area of a triangle when you only know the 3 sides.

Hint: You will need nested conditionals for this.

Paste your code here.

```
# Your code should go here
```

```python
#https://www.mathopenref.com/heronsformula.html
import math

print("What shape? (square or triangle)")
shape = input().strip().lower()

if shape == "square":
    print("Area or Perimeter?")
    option = input().strip().lower()
    side_length = float(input("Side length? "))

    if option == "area":
        area = side_length ** 2
        print("Area of Square:", area)
    elif option == "perimeter":
        perimeter = 4 * side_length
        print("Perimeter of Square:", perimeter)
    else:
        print("Invalid option for square. Please choose 'Area' or 'Perimeter'.")

elif shape == "triangle":
    print("Area or Perimeter?")
    option = input().strip().lower()
    side_a = float(input("Side A length? "))
    side_b = float(input("Side B length? "))
    side_c = float(input("Side C length? "))

    if option == "perimeter":
        perimeter = side_a + side_b + side_c
        print("Perimeter of Triangle:", perimeter)
    elif option == "area":
        s = (side_a + side_b + side_c) / 2
        area = math.sqrt(s * (s - side_a) * (s - side_b) * (s - side_c))
        print("Area of Triangle:", area)
    else:
        print("Invalid option for triangle. Please choose 'Area' or 'Perimeter'.")

else:
    print("Incorrect input! Please choose 'square' or 'triangle'.")
```

3b) [bonus; 5 points] Add to your code from 3a the algorithms for determining the perimeter and area of a regular pentagon. Instead of asking for a square or triangle, you should ask for pentagon, square, or triangle. Just like a square, your code should only ask the user for a single side length to the pentagon, because in a regular pentagon, all the sides have the same length. Do not ask the user to type in the apothem[2].

```
# Your code should go here
```

[2] Who the heck knows what an apothem is off the top of their heads?