Module1: Assignment 1

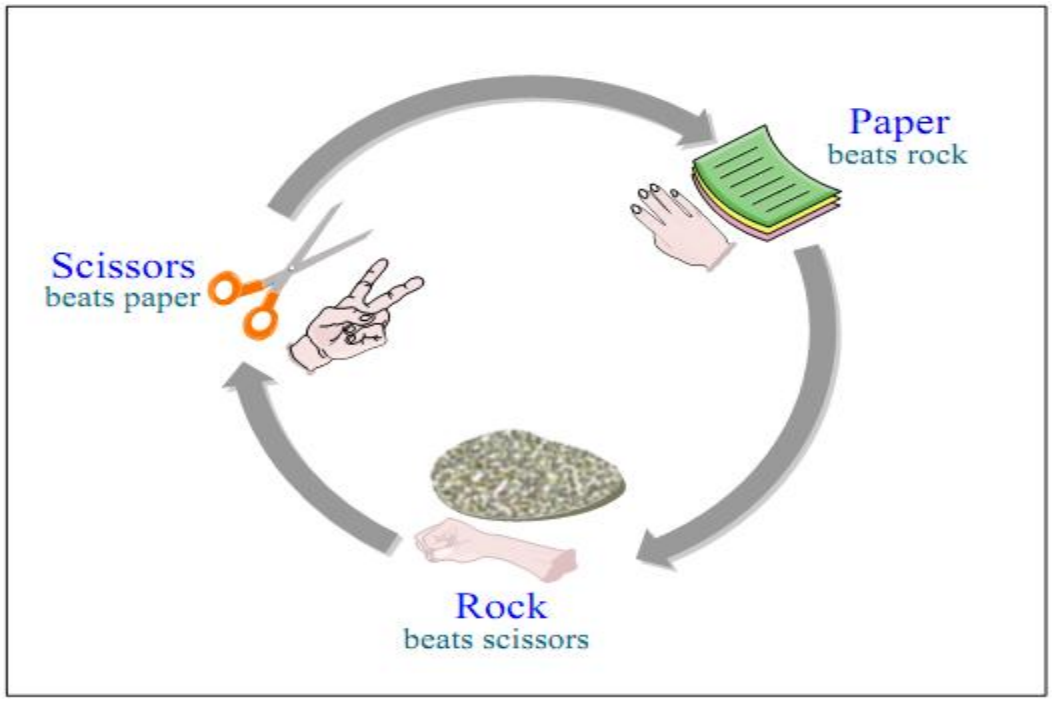
BCAC0009 Python Programming

BCA(H) I Yr II Semester

Q1. Transcribe the following equations into Python (without simplifying!), preserving order of operation with parenthesis as needed. Save each as the value of a variable, and then print the variable.

1. $\frac{3 \times 5}{2 + 3}$
2. $\sqrt{7 + 9} \times 2$
3. $(4 - 7)^3$
4. $\sqrt[4]{-19 + 100}$

Q2. **Rock, Paper, Scissors,** In this exercise, you are going to practice using conditionals (if, elif, else)and randint() function. You will write a small program that will determine the result of a rock, paper, scissors game, given Computer and Player 1's choices. Your program will print out the result. Here are the rules of the game:



Q3. Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . , 1/10

Q4. Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero. What should your program do if the user inputs a negative number? Your program should consider only positive number.

Q5. Write a program in python to demonstrate the ”Roll a Dice” problem. Output will displayed over the screen, asked the user for repeated play.

Q6. **Collision detection of balls**

Many games have complex physics engines, and one major function of these engines is to figure out if two objects are colliding. Weirdly-shaped objects are often approximated as balls. In this problem, we will figure out if two balls are colliding. We will think in 2D to simplify things, though 3D isn't different conceptually. For calculating collision, we only care about a ball's position in space and its size. We can store position with its center x-y coordinates, and we can use its radius for size. So a ball is a tuple of **(x, y, r)**. To figure out if two balls are colliding, we need to compute the distance between their centers, then see if this distance is *less* than the sum of their radii. If so, they are colliding. Write a function that takes two balls and computes if they are colliding. Then call the function with two sets of balls. The first set is (0, 0, 1) and (3, 3, 1); these should not be colliding. The second set is (5, 5, 2) and (2, 8, 3); these should be colliding.

Q7. **Pig-Latin Converter**

Write a program that lets the user enter in some English text, then converts the text to Pig-Latin. To review, Pig-Latin takes the first letter of a word, puts it at the end, and appends “ay”. The only exception is if the first letter is a vowel, in which case we keep it as it is and append “hay” to the end. E.g. “hello” → “ellohay”, and “image”→ “imagehay” It will be useful to define a list or tuple at the top called **VOWELS**. This way, you can check if a letter *x* is a vowel with the expression **x in VOWELS.**

.