

1. Use the following code to answer the below questions

```

1  if my_var % 2 == 1:
2      if my_var**3 != 27:
3          my_var = my_var +4  #Assignment 1
4      else:
5          my_var /= 1.5      #Assignment 2
6  else:
7      if my_var <= 10:
8          my_var *= 2        #Assignment 3
9      else:
10         my_var -= 2        #Assignment 4
11  print(my_var)

```

- (a) Find four values of `my_var` so each of the four assignment statements will be executed: each value should cause one assignment statement to be executed.
- (b) Find four ranges of `my_var` values that will cause each of the four assignment statements to be executed.

2. In your own words, describe the difference in logic of the following two sets of code:

(a)

```

1  if Boolean_A:
2      Block_X
3  if Boolean_B:
4      Block_Y

```

(b)

```

1  if Boolean_A:
2      Block_X
3  elif Boolean_B:
4      Block_Y

```

3. When driving in a car and approaching a traffic control light, *green* means go, *yellow* means yield, and *red* means stop. Assuming there is a variable named `light_color`, write a program that prints either the word *go*, *yield*, or *stop* depending of the value of `light_color`. Let the user input the value of `light_color`.
4. Write a program that asks the user for three numbers, and then determines (and outputs) which of the numbers is the largest. Do not use the built-in function `max()`.

For example,

```

Pick a number: 10
Pick another number: 9
Pick another number: 15
The largest number is 15.

```

```

Pick a number: 21
Pick another number: 3
Pick another number: 17
The largest number is 21.

```

5. Write a program that asks the user for three numbers, and then determines (and outputs) which of the numbers is the smallest. Do not use the built-in function `min()`.

For example,

```

Pick a number: 35
Pick another number: 11
Pick another number: 89
The smallest number is 11.

```

```

Pick a number: 3
Pick another number: 2
Pick another number: 1
The smallest number is 1.

```

6. (Game: heads or tails) Write a program that lets the user guess whether the flip of a coin results in heads or tails. The program randomly generates an integer 0 or 1, which represents head or tail. The program prompts the user to enter a guess and reports whether the guess is correct or incorrect. Hint: These should be your first two lines of code.

```

from random import randint
value = randint(0,1) #picks a random integer. Either 0 or 1.

```

7. Write a program that prompts the user for a letter and checks whether the letter is a vowel or consonant. A vowel should output “*vowel*”, and a consonant should output *consonant*. You may assume only lower case letters. Below is sample output.
Hint: In the English language, a, e, i, o, and u are the vowels.

```
Enter a letter: a
vowel
```

```
Enter a letter: x
consonant
```

8. At the local ice cream store they have 3 flavors, which are Vanilla, Chocolate, and Strawberry. Write a program that ask the user which type of ice cream they want and print the flavor they selected. However, if they picked a flavor that is not available, inform the user of such.

```
Pick a flavor: vanilla
Here is your vanilla ice cream!
```

```
Pick a flavor: mint
Sorry, we don't have mint ice cream.
```

9. Luke Skywalker has friends and family, but he is getting older and having trouble remembering them all. Write a program that Luke (the user) can input a name and it outputs the relation defined in the table below.

Person	Relation
Darth Vader	Father
Leia	Sister
Han	Brother in law
R2D2	Droid

*If he types any other name, report “unknown”.

10. Write a program that prompts the user to enter three integers and displays the integers in increasing order (smallest to largest). You may not use the built-in functions *max()*, *min()*, *sort()* or *sorted()*.
11. Write a program that prompts the user to enter three integers and displays the integers in decreasing order (largest to smallest). You may not use the built-in functions *max()*, *min()*, *sort()* or *sorted()*.
12. In Harry Potter, the currency consists of knuts, sickle, and galleon. There are 29 knuts in one sickle and 17 sickles in one galleon. Write a program that will convert some amount of knuts into the fewest amount of coins possible. Only print non-zero values, meaning don’t print something similar to “0 sickles.” For example,

- Given 32 knuts, output 1 sickle 3 knuts
- Given 544 knuts, output 1 galleon 4 sickles 18 knuts
- Given 993 knuts, output 2 galleons 7 knuts. Do **not** output 2 galleons 0 sickle 7 knuts.

13. Ask the user for three integers. Determine (and output) how many copies of the same number the user entered.

For example,

```
Pick a number: 1
Pick another number: 2
Pick another number: 3
each number is unique
```

```
Pick a number: 7
Pick another number: 5
Pick another number: 7
You entered the same number 2 times.
```

14. Primary U.S. interstate highways are numbered 1-99. Odd numbers (like 5 or 95) go north/ south, and evens (like 10 or 82) go east/west. Auxiliary highways are numbered 100-999, and service the primary highway indicated by the rightmost two digits. Thus, I-405 services I-5, and I-290 services I-90.

Note: 200 is not a valid auxiliary highway because 00 is not a valid primary highway number.

Let the user pick a highway number. Given a valid highway number, indicate whether it runs north/south or east/west. If it is an invalid highway number, indicate that it is an invalid highway number. For example,

```
Pick a highway number: 400
Invalid highway number
```

```
Pick a highway number: 694
highway 694 runs east/west
```

```
Pick a highway number: 305
highway 305 runs north/south
```

```
Pick a highway number: 35
highway 35 runs north/south
```

15. Create a game of Rock, Paper, Scissors that takes user inputs. The first input should be player 1 and the second input should be player 2. Print the winner according to the following rules.

- Rock beats Scissors
- Scissors beats Paper
- Paper beats Rock

For example:

```
Player 1 choice: Rock
Player 2 choice: Paper
player 2 wins!
```

```
Player 1 choice: Scissors
Player 2 choice: Paper
player 1 wins!
```

```
Player 1 choice: Rock
Player 2 choice: Rock
It's a tie!
```

16. Write a program that asks the user for three side lengths of a triangle, and prints the type of triangle. The types of triangles are

- No sides equal: "scalene"
- Two sides equal: "isosceles"
- All sides equal: "equilateral"

For example:

```
Pick side length 1: 4
Pick side length 2: 6
Pick side length 3: 7
scalene triangle
```

```
Pick side length 1: 5
Pick side length 2: 8
Pick side length 3: 5
isosceles triangle
```

```
Pick side length 1: 9
Pick side length 2: 9
Pick side length 3: 9
equilateral triangle
```

17. The table below show what your resting heart rate should be based on age and athleticism. Write a program that asks the user their age and desired athleticism goal, and then outputs what their resting heart rate should be.

Age	Athleticism	
	Above Average	Below Average
20 – 39	47 – 72	73 – 93
40 – 59	46 – 71	72 – 94
60 – 79	45 – 70	71 – 97

Your end output should look similar to this

```
Enter your age: 45
Enter your athleticism goal: Below Average
Your resting heart rate should be between 72–94.
```

18. The table below shows the maximum health of characters based on race and class for a new video game I am creating. Write a program that asks the user for the race and the class of their character, and then sets the *health_points* variable according to the table below.

```
health_points = -1
#Your code here.
```

Class	Race	
	Elf	Ogre
Warrior	150	200
Bard	75	100
Wizard	25	50

19. The table below shows what time different age groups (by grade) can swim at the pool. There are two time options, morning and afternoon. Write a program that asks the user their grade and whether they'd like to go in the morning or afternoon, and outputs the time the pool is available for them.

Grade	Pool times	
	Morning	Afternoon
k, 1 – 3	9 AM	1 PM
4 – 8	10 AM	2 PM
9 – 12	11 AM	3 PM

Your end output should look similar to this

```
Enter your grade: 5
Enter Morning OR Afternoon: Morning
The pool is open at 10 AM.
```