

# Python

## Assignment Questions



**Q1. Explain with an example each when to use a for loop and a while loop.**

**Q2. Write a python program to print the sum and product of the first 10 natural numbers using for and while loop.**

**Q3. Create a python program to compute the electricity bill for a household.**

The per-unit charges in rupees are as follows: For the first 100 units, the user will be charged Rs. 4.5 per unit, for the next 100 units, the user will be charged Rs. 6 per unit, and for the next 100 units, the user will be charged Rs. 10 per unit, After 300 units and above the user will be charged Rs. 20 per unit.

You are required to take the units of electricity consumed in a month from the user as input.

Your program must pass this test case: when the unit of electricity consumed by the user in a month is 310, the total electricity bill should be 2250.

**Q4. Create a list of numbers from 1 to 100. Use for loop and while loop to calculate the cube of each number and if the cube of that number is divisible by 4 or 5 then append that number in a list and print that list.**

**Q5. Write a program to filter count vowels in the below-given string.**  
string = "I want to become a data scientist"

**Note:** Create your assignment in Jupyter notebook and upload it in GitHub & share that github repository link through your dashboard.

1. In Python, both for loops and while loops are used for repeating a set of instructions multiple times. However, there are certain situations where one loop may be more appropriate than the other. Here are some examples:

When to use a for loop:

When you want to iterate over a sequence of elements (such as a list, tuple, or string) and perform some operation on each element.

When you know in advance how many times you need to repeat the loop.

When you want to execute a set of statements for each element in a sequence.

Example:

Suppose you have a list of numbers and you want to print each number in the list. In this case, you can use a for loop to iterate over the list and print each number:

```
numbers = [1, 2, 3, 4, 5]
for num in numbers:
    print(num)
```

When to use a while loop:

When you want to repeat a set of instructions as long as a certain condition is true.

When you don't know in advance how many times you need to repeat the loop.

When you want to repeat a set of instructions until a certain condition is met.

Example:

Suppose you want to keep asking the user to enter a number until they enter a number that is divisible by 5. In this case, you can use a while loop to repeat the input statement until the user enters a number that meets the condition:

```
num = 0
while num % 5 != 0:
    num = int(input("Enter a number: "))
    print("The number you entered is divisible by 5.")
```

2. # Calculate the sum of the first 10 natural numbers

```
sum = 0
```

```
for i in range(1, 11):
```

```
    sum += i
```

```
print("Sum of first 10 natural numbers is:", sum)
```

```
# Calculate the product of the first 10 natural numbers
```

```
product = 1
```

```
for i in range(1, 11):
```

```
    product *= i
```

```
print("Product of first 10 natural numbers is:", product)
```

```

# Calculate the sum of the first 10 natural numbers
sum = 0
i = 1
while i <= 10:
    sum += i
    i += 1

print("Sum of first 10 natural numbers is:", sum)

# Calculate the product of the first 10 natural numbers
product = 1
i = 1
while i <= 10:
    product *= i
    i += 1

print("Product of first 10 natural numbers is:", product)

```

4.

```

cubes = []
for i in range(1, 101):
    cube = i**3
    if cube % 4 == 0 or cube % 5 == 0:
        cubes.append(cube)

print(cubes)

```

```

cubes = []
i = 1
while i <= 100:
    cube = i**3
    if cube % 4 == 0 or cube % 5 == 0:
        cubes.append(cube)
    i += 1

print(cubes)

```

3.

```

units = int(input("Enter the number of units consumed: "))
bill = 0

```

```

if units <= 100:
    bill = units * 4.5
elif units <= 200:
    bill = 100 * 4.5 + (units - 100) * 6
elif units <= 300:
    bill = 100 * 4.5 + 100 * 6 + (units - 200) * 10
else:
    bill = 100 * 4.5 + 100 * 6 + 100 * 10 + (units - 300) * 20

print("Total electricity bill: Rs.", bill)

```

```
5.  
a='aeiouAEIOU'  
b= "I want to become a data scientist"  
c=0  
for i in a:  
    for j in b:  
        if i==j:  
            c+=1  
print(c,"number of vowels")
```