

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

ans : (1)for loop : The for loop is used when the number of iterations is already known. (2)while loop : A while loop is used when the number of iterations is unknown. The statement repeats itself till the boolean value becomes false

In [1]:

```
#example of for loop
i = 0
while (i<6):
    print(i)
    i = i+1

#example of while loop
i = 0
while(i<6):
    print(i)
    i = i+1
```

0  
1  
2  
3  
4  
5  
0  
1  
2  
3  
4  
5

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

In [2]:

```
#for loop
#sum
sum = 0
for i in range(1,11):
    sum += i
print(sum)
#product
product = 1
for i in range(1,11):
    product *= i
print(product)

#while loop
#sum
sum = 0
i = 1
while i < 11:
    sum += i
    i += 1
print(sum)
#product
product = 1
i = 1
while i < 11:
    product *= i
    i += 1
print(product)
```

```
55
3628800
55
3628800
```

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.

In [3]:

```
unit = int(input("Enter number of unit : "))
if (unit<=100):
    print("pay amount is : ",unit*4.5)
elif(unit<=200):
    print("pay amount is : ",450+(unit-100)*6)
elif(unit<=300):
    print("pay amount is : ",1050+(unit-200)*10)
elif(unit>300):
    print("pay amount is : ",2050+(unit-300)*20)
```

```
Enter number of unit : 310
pay amount is : 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.

In [4]:

```
#for loop
list1 = []
for i in range(1,101):
    cube = i**3
    if (cube%4==0 or cube%5==0):
        list1.append(i)
print(list1)

#while loop
list1 = []
i = 1
while i < 101:
    cube = i**3

    if (cube%4==0 or cube%5==0):
        list1.append(i)
    i +=1
print(list1)
```

```
[2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 3
4, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54, 55, 56, 58, 60, 62, 64,
65, 66, 68, 70, 72, 74, 75, 76, 78, 80, 82, 84, 85, 86, 88, 90, 92, 94, 9
5, 96, 98, 100]
[2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 3
4, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54, 55, 56, 58, 60, 62, 64,
65, 66, 68, 70, 72, 74, 75, 76, 78, 80, 82, 84, 85, 86, 88, 90, 92, 94, 9
5, 96, 98, 100]
```

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

In [5]:

```
string = "I want to become a data scientist"
vowels = "aeiouAEIOU"
count = 0

for i in string:
    if i in vowels:
        count += 1

print("Number of vowels in the string:",count)
```

Number of vowels in the string: 12

In [ ]:

