

# for and while loop

February 27, 2023

[3]: *# 1. Explain with an example each when to use a for loop and a while loop.*

```
[4]: # for Loop
'''We use a for loop in Python when we want to iterate through a collection of
    ↪ items, such as a list or a dictionary, and perform a specific action on each
    ↪ item in the collection.
For Example: Suppose we have a basket of apples and we want to count how many
    ↪ apples we have. We can use a for loop to help us count each apple in the
    ↪ basket.
        we use a for loop to iterate through the list of apples and count
    ↪ the number of red apples in the basket'''

# Creating a list of apples
apples = ["red apple", "green apple", "yellow apple", "red apple", "green
    ↪ apple"]

# Using a for loop to count the number of red apples in the basket
count = 0
for apple in apples:
    if apple == "red apple":
        count += 1

# Printing the count of red apples in the basket
print("There are", count, "red apples in the basket.")
```

There are 2 red apples in the basket.

```
[13]: # while Loop
'''We use a for loop in Python when we want to repeat a certain task until a
    ↪ condition is met.
For Example: Suppose we want to keep asking someone for their age until they
    ↪ give us a valid input.
        We can use a while loop to keep asking until the condition is true.
    ↪ '''

# Creating variable age and assigning value as 0
age = 0
```

```
# Using a while loop will keep asking for input until the user enters a valid
↪age (a positive number)
while age <= 0:
    age = int(input("Please enter your age: "))

# Printing the age
print("Your age is:", age)
```

Please enter your age: -10  
 Please enter your age: 0  
 Please enter your age: 5  
 Your age is: 5

[15]: #Q2. Write a python program to print the sum and product of the first 10  
 ↪natural numbers using for and while loop.

[20]: # Calculate the sum and the product of the first 10 natural number using for  
 ↪loop

```
result = 0
product = 1
for i in range(1,11):
    result = result+i
    product = product*i
    i=i+1

print('Sum of first 10 natural numbers : ', result)
print('Product of first 10 natural numbers : ', product)
```

Sum of first 10 natural numbers : 55  
 Product of first 10 natural numbers : 3628800

[30]: # Calculate the sum and the product of the first 10 natural number using while  
 ↪loop

```
result1 = 0
product1 = 1
i = 1
while i<=10:
    result1 = result1+i
    product1 = product1*i
    i=i+1

print('Sum of first 10 natural numbers : ', result1)
print('Product of first 10 natural numbers : ', product1)
```

Sum of first 10 natural numbers : 55  
 Product of first 10 natural numbers : 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.
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.'''
```

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[5]: # Calculate the Total Electricity bill on the units of electricity consumed by
    ↳the user
units = 0
total = 0
while units <= 0:
    units = int(input('Enter the units of electricity consumed in a month : '))
    if units <= 100:
        total = units * 4.5
    elif units >100 and units <=200:
        total = 100 * 4.5 + (units-100)*6
    elif units >200 and units <=300:
        total = 100 * 4.5 + 100 * 6 + (units-200) * 10
    elif units >300:
        total = 100 * 4.5 + 100 * 6 + 100 * 10 + (units - 300) * 20
    print("Total Electricity bill : Rs.", total)
```

Enter the units of electricity consumed in a month : 310  
Total Electricity bill : Rs. 2250.0

```
[3]: # Calculate the electricity bill for each household one by one, based on the
    ↳number of units consumed.
num_households = int(input("Enter the number of households: "))

for i in range(num_households):
    units = int(input("Enter the number of units consumed by household " +
    ↳str(i+1) + ": "))
    total = 0
    if units <= 100:
        total = units * 4.5
    elif units <= 200:
        total = 100 * 4.5 + (units-100) * 6
    elif units <= 300:
        total = 100 * 4.5 + 100 * 6 + (units-200) * 10
```

```

else:
    total = 100 * 4.5 + 100 * 6 + 100 * 10 + (units-300) * 20
    print("Electricity bill for household " + str(i+1) + ": Rs.", total)

```

Enter the number of households: 1

Enter the number of units consumed by household 1: 310

Electricity bill for household 1: Rs. 2250.0

```

[4]: ''' 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.'''

```

```

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

```

```

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

      #using while loop
      cube1 = []
      num = 1
      while num <= 100:
          if (num**3)%4==0 or (num**3)%5==0 :
              cube1.append(num)
          num += 1
      print(cube1)

```

```

[2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 34, 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, 95, 96, 98, 100]
[2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 32, 34, 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, 95, 96, 98, 100]

```

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

```

```

[6]: ' Q5 Write a program to filter count vowels in the below-given string.\nstring =
      "I want to become a data scientist"\n'

```

```
[13]: string = 'I want to become a data scientist'
count = 0
for i in string:
    if i=='A' or i=='E' or i=='I' or i=='O' or i=='U' or i=='u' or i=='a' or i=='e' or i=='i' or i=='o':
        count = count + 1
print('The count of vowels in the given string is : ',count)
```

The count of vowels in the given string is : 12

[ ]: