

PYTHON

From Simple to Complex With Examples

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NOTE!!!

In these notes Screenshots of practice examples and coding are added. The code files are also available in code folder that contain .ipynb files that are created on Jupyter notebook.

Chapter5

Loops in Python

- Loops
 - While loop

While loop is used when we need iterations.
For example, we want to print 1st 10 numbers.

Syntax:

- Initialization
- while condition:
- #Procedure here
- increment

```
i=1
while i<=10:
    print(i)
    i+=1
```

1
2
3
4
5
6
7
8
9
10

- **TODO Task**

Take a number from user as input than calculate sum of number from 0 to number than print using while loop.

```
n=int(input("Enter any number:"))
sum=0
i=1
while i<=n:
    sum+=i
    i+=1
print(f"sum of numbers from 0 to {n} is:{sum}")
```

```
Enter any number:5
sum of numbers from 0 to 5 is:15
```

- **TODO Task**

Take any number from user than calculate sum of digits of number and print them.

```
number=input("Enter any number string number of digits should be greater than 1 i.e 1432:")
n=len(number)
i=0
sum=0
m=0
while i<n:
    m=int(number[i])
    sum+=m
    i+=1
print(f" sum of digits of number is:{sum}")
```

```
Enter any number string number of digits should be greater than 1 i.e 1432:200
sum of digits of number is:2
```

• TODO Task

Take input from user name than count how many times each character occurs in name if a character occur many times than print count of character only one time.

```
name=input("Enter your name:")
i=0;
n=len(name)
temp=""
while i<n:
    if name[i] not in temp:
        temp+=name[i]
        print(f"{name[i]} is {name.count(name[i])} times")
    i+=1
```

```
Enter your name:ayesha noreen
a is 2 times
y is 1 times
e is 3 times
s is 1 times
h is 1 times
i is 1 times
n is 2 times
o is 1 times
r is 1 times
```

○ for loop

for loop uses range function which takes start of loop end of loop and step. For loop by default increments by one. For example, print 1st 10 numbers.

Syntax:

```
for index in range(start,end+1,step):  
    #procedure here
```

```
for index in range(1,11):  
    print(index)
```

```
1  
2  
3  
4  
5  
6  
7  
8  
9  
10
```

- **TODO Task**

Take any number from user and print its table by using for loop.

```
number=int(input('Enter any number:'))
for index in range(1,11):
    ans=number*index
    print(number,'X',index,'=',ans)
```

Enter any number:5

5 X 1 = 5
5 X 2 = 10
5 X 3 = 15
5 X 4 = 20
5 X 5 = 25
5 X 6 = 30
5 X 7 = 35
5 X 8 = 40
5 X 9 = 45
5 X 10 = 50

○ infinite loop

It is a loop that repeats itself infinite many times.

to control infinite loop press ctrl+c

- infinite loop by our own permission

while True:

```
    print("Hello world")
```

- infinite loop mistakenly

```
i=0
```

```
while i<10:
```

```
    print("Hello World")
```

```
    i+=1 forgot
```

- **Break statement**

Break statement is used to break the execution for example we start a loop from 0 to 10 and we want to print only 0 to 5 than apply break statement after 5. As,

```
▼   for i in range(0,11):  
▼       if i==6:  
            break  
        print(i)
```

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

- **continue statement**

continue statement is used for continuation of execution if we want to print 0,1,2,3,4,5,7,8,9 and loop is of 0 to 10 then apply condition if $i==6$ then continue means it does not print 6 it goes back for continuation then increment and print 7 and so on.

```
▼   for i in range(0,11):  
▼       if i==6:  
            continue  
        print(i)
```



```
0  
1  
2  
3  
4  
5  
7  
8  
9  
10
```

Number Guessing Game

Generate any random number by using random function and take input from user to guess any number than check guessing number with random number if same than print you win if less than print you are too low if greater than print you are too high and take input again and again until you win than at last show how many attempts you made.

Code

```
import random
i=1
print("*****")
print("*Number Guessing Game*")
print("*****")
winning_number=random.randint(1,100)
guessing_number=int(input("Guess any number between 1-100:"))
while guessing_number!=winning_number:
    if guessing_number<winning_number:
        print("\U0001F610\U0001F610\U0001F610you are too low\U0001F610\U0001F610\U0001F610")
        guessing_number=int(input("Enter again"))
        i+=1
    elif guessing_number>winning_number:
        print("\U0001F610\U0001F610\U0001F610You are too high\U0001F610\U0001F610\U0001F610")
        guessing_number=int(input("Enter again"))
        i+=1
    else:
        print("Number is not in range")
if guessing_number==winning_number:
    print("\U0001F603\U0001F603\U0001F603you win\U0001F603\U0001F603\U0001F603")
print(f"you attempts {i} times")
```

Acti
Go to

Output

```
*****  
*Number Guessing Game*  
*****  
Guess any number between 1-100:50  
😞😞😞you are too low😞😞😞  
Enter again80  
😞😞😞you are too low😞😞😞  
Enter again95  
😞😞😞You are too high😞😞😞  
Enter again85  
😞😞😞you are too low😞😞😞  
Enter again90  
😞😞😞you are too low😞😞😞  
Enter again93  
😞😞😞you win😞😞😞  
you attempts 6 times
```