

VASAVI COLLEGE OF ENGINEERING

(AUTONOMOUS)
(Affiliated to Osmania University)
Hyderabad - 500 031.

DEPARTMENT OF : CSE

NAME OF THE LABORATORY : PPLAB

Name K. SREE INDIRA SIVANI Roll No. 1602-21-733-052 Page No. 23.

PRELAB QUESTIONS: 2

- 1) What are looping statements in python? Write each one of the statements with examples along with flow chart.

Ans: There are 2 types of looping statements in python :

- while loop
- for loop

1) while loop:

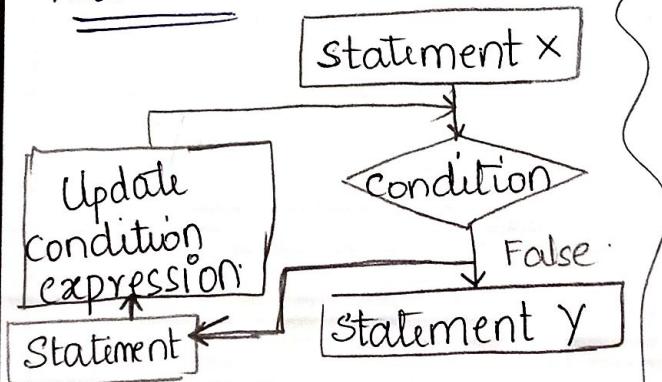
while (cond):
 statements
 ≡

else:
 statements

if condition fails;
else part is executed

Ex: Sum of first 10 natural numbers.
 $\text{sum} = 0$
 $i = 1$
while ($i \leq 11$):
 $\text{sum} += i$
 $i += 1$
print("sum is ", sum)

Flowchart:



2) for loop:

for loop-control-var in range(a, b+1):
 statements

else:
 statements

Ex: Sum=0
for i in range(1, 11):
 sum+=i
print(sum)

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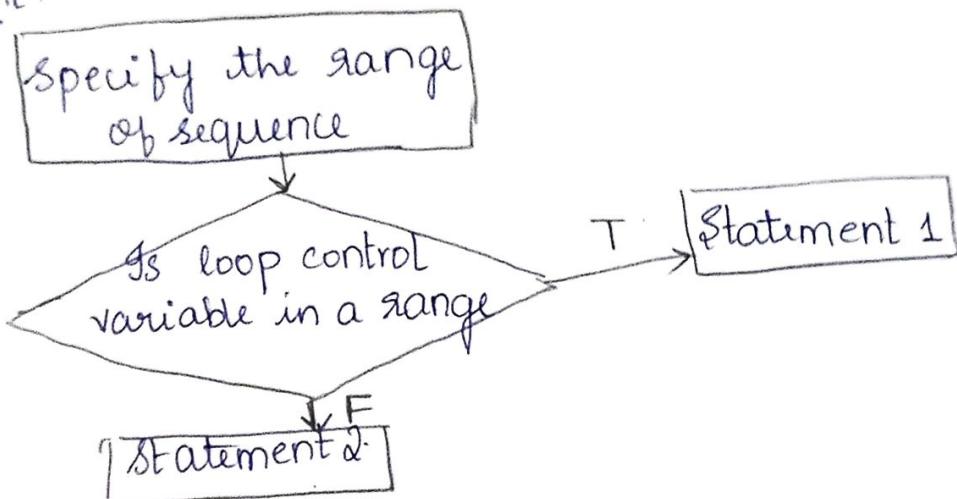
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Flowchart:



2) What are nested loop statements in python? Give example:

Ans: A loop ('inner') is present inside an outer loop
leads to a nested loop.

Ex: `for i in range(1,4)`
`for j in range(1,6)`
`print(j, end=" ")`
`print()`

O/P: 1 2 3 4 5
 1 2 3 4 5
 1 2 3 4 5 .

3) Difference between user-defined and built-in functions in python:

- User defined modules are the created by an user according to one's convince and storing them as modules and using them whenever necessary.
- Built in functions are pre-defined and stored in different libraries. The user can call these functions into his main program whenever needed.

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- 4) What are functions in python? Give the syntax and example of definition of function and function call?
→ A function is a block of organized and reusable program code that performs a single, specific and well-defined task.

*SYNTAX

Function definition:

```
def funcname(v1, v2, v3)
    documentation string
    function statements
    return [exp]
```

Ex: def display()

```
    """ Displays Hello msg """
    print("hello")
    return
```

Function Call:

```
funcname(v1, v2, -----, vn)
```

Ex:

```
display()
```

PRELAB PROGRAMS: 2

- 1) Write a program using functions to check whether 2 numbers are equal (or) not.

```
def check(a, b):
    print(a == b)
```

```
x = int(input("Enter a number"))
y = int(input("Enter a number"))
check(x, y).
```

Output:

Enter a number 10

Enter a number 10

True.

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2) Write a program using functions to swap 2 numbers:

* def swap(a,b):

 temp=a

 a = b

 b = temp

print("Enter 2 numbers")

x=int(input())

y=int(input())

swap(x,y)

print("Swapped=",x,",",y)

Output:

Enter 2 numbers

15

5

Swapped = 5,15.

3) Write a program to convert time (given in hrs & minutes) to minutes using functions:

* def convert(h,m):

 min = h×60+m

 print("The minutes =", min)

p = int(input("Enter the no. of hours:"))

q = int(input("Enter the no. of minutes:"))

convert(p,q)

Output:

Enter the no. of hours: 4

Enter the no. of minutes: 50

The minutes = 290

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- 4) Write a program to display the square of numbers between 1 and 20 using functions:

```
def square():
    for i in range(1, 21):
        for j in range(1, 21):
            if ((i * i) == j):
                print(j)
                break
```

} Output:
1
4
9
16

- 5) Write a program to display the roots of the quadratic equation using functions:

```
def r(a, b, c):
    D = b * b - 4 * a * c
    d = 2 * a
    if (D == 0):
        print("Real and equal only one roots = ", -b / d)
```

```
elif (D > 0):
    print("Real and different roots")
    print("r1 = ", (-b + (D)**0.5) / d)
    print("r2 = ", (-b - (D)**0.5) / d).
```

```
else:
    print("Imaginary roots")
```

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$x = \text{int}(\text{input}("Enter the } x^2 \text{ coefficient:"))$

$y = \text{int}(\text{input}("Enter the } x \text{ coefficient:"))$

$z = \text{int}(\text{input}("Enter the constant:"))$

$r(x, y, z)$

Output:

Enter the x^2 coefficient: 1

Enter the x coefficient: 2

Enter the constant: 1

Real and equal roots = -1

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LAB PROGRAMS : 2

* AIM: Programs to illustrate the syntax of functions :

PROBLEM STATEMENTS:

1) Write a program to implement the basic calculator operations using functions:

* Program:

```
def add(a,b):  
    print("Sum of 2 numbers=", a+b)  
def sub(a,b):  
    print("Difference of 2 numbers=", a-b)  
def product(a,b):  
    print("Product of 2 numbers=", a*b)  
def div(a,b):  
    print("Quotient of 2 numbers=", a/b)  
  
print ("Enter 2 numbers")  
a = int(input())  
b = int(input())  
print("Choose an option: 1. Addition\n 2. Subtraction\n 3. Multiplication\n 4. Division")  
  
c = int(input())  
if c == 1:  
    add(a,b)
```

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elif c == 2:

 sub(a, b)

elif c == 3:

 product(a, b)

elif c == 4:

 div(a, b)

else:

 print("Enter a number")

{ O/P:

Enter 2 numbers

12

8

choose an option: 1. Addition

2. Subtraction

3. Multiplication

4. Division

3

Product of 2 numbers = 135

2) Write a program to find the sum of digits of a given no using functions:

→ def s(n):

rem = ~~n % 10~~ rem = 0; a = 0

 while(n != 0):

 rem = n % 10

 a += rem

 n = n // 10

 print("Sum of digits = ", a)

n = int(input("Enter a number"))

s(n).

{ Output:

Enter a number

121

Sum of digits = 4

3) Write a program to check whether the given number is palindrome (or) not.

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* def check(num):
 rev=0 ; n=num
 while (num!=0):
 rem=num%10
 num//=10
 rev=rev*10+rem
 if (rev==n):
 print ("Palindrome")
 else:
 print ("Not a palindrome")

n=int(input("Enter a number")).
check(n).

{ OUTPUT:

- 1) Enter a number=121
Palindrome
- 2) Enter a number=135
Not a palindrome

4) Write a program to check divisibility of 2 numbers.

def check(a,b):
 print(a%b==0)
 print(b%a==0).
print("Enter 2 numbers")
a=int(input())
b=int(input())
check(a,b).

{ output:

Enter 2 numbers

12
6

True
False.

5) WAP to check whether the no is prime or not.

def prime(n)
 flag=0
 for i in range(2,n):

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if ($n \% i == 0$):

 flag = 1

 break

if (flag == 0):

 print ("Given number is prime").

else:

 print ("Given number is not prime")

n = int(input ("Enter a number"))

prime(n)

Output:

1) Enter a number 12

Given number is
not prime

2) Enter a number 13

Given number
is prime.

Q) WAP to calculate area of circle given centre & point on the circumference.

def area(r):

 area = 3.14 * r * r

 print ("Area of circle = ", area).

def distance (a, b, c, d):

 x = a - c

 y = b - d

 d = ((x)**2 + (y)**2)**0.5

 return d.

Output:

Enter the coordinates
of center.

5.
8.

Enter the coordinates
of point on circumference

10
6

Area of the circle
= 91.0599999

print ("Enter the coordinates of center").

p = int(input())

q = int(input())

print ("Enter the coordinates of a point on circumference").

r = int(input())

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s = int(input())

t = distance(p, q, r, s)

area(t)

7) Find maximum of 3 given numbers.

* def max(a, b, c)

if a > b and a > c:

 print("Maximum number is =", a)

elif b > a and b > c:

 print("Maximum number is =", b)

else: print("Maximum number is =", c).

print("Enter 3 numbers").

x = int(input())

y = int(input())

z = int(input())

max(x, y, z)

{ OUTPUT:

Enter 3 numbers

5

10

15

Maximum number
is = 15.

8) Check whether the given number is in given range:

* def check(x, y, n):

 if n >= x and n <= y:

 print("No is in the range").

 else:

 print("No not in the range")

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```
n=int(input("Enter a number"))
a=int(input("Enter lower limit"))
b=int(input("Enter upper limit"))
check(a,b,n)
```

OUTPUT:

Enter a number 8

Enter lower limit 5

Enter upper limit 15

Number 8

No is in the range

a) check whether the given no is an Armstrong No or not.

```
def armstrong(num):
```

```
s=0
while (num!=0)
    rem=num%10
    num//=10
    s+=rem**3
```

```
if (n==s):
```

print("Armstrong Number")

```
else:
```

print("Not a Armstrong Number")

OUTPUT:

Enter the number 153
Armstrong Number

Enter the number 135
Not a Armstrong
Number

```
n=int(input("Enter the number"))
```

```
armstrong(n).
```

b) Check whether given no is a Perfect No. (or) not:

```
def perfect(n):
```

num=n

sum=0

```
for i in range(1,num):
    if (num%i==0):
```

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```
Sum+=i
if (sum==n):
    print ("Given no. is perfect")
else:
    print ("Given no. is not perfect")
n=int(input("Enter a number"))
perfect(n)
```

Output:
Enter a number 6
Given no is perfect

11) WAP to demonstrate the access of function inside another function:

```
* def s(l,b):
    s=l+b
    def perimeter(r):
        print('Perimeter of rectangle= " 2*r')
    perimeter(s)
a=int(input("Enter length"))
b=int(input("Enter breadth"))
s(a,b)
```

Output:
Enter length 5
Enter breadth 10
Perimeter of rectangle = 30

12) WAP to calculate the factorial of a no:

```
def factorial(n)
    fact=1
    for i in range(1,n+1):
        fact*=i
    print("Factorial of",n,"is",fact)
n=int(input("Enter a no")); factorial(n)
```

Output:
Enter a no 5
Factorial of 5 is 120

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13) WAP to print Fibonacci Series:

```
* def fib(n):  
    t1=0; t2=1  
    print(t1, "In", t2)  
    for i in range (2,n+1):  
        term = t1 + t2  
        print(term)  
        t1 = t2  
        t2 = term  
  
n=int(input(" Enter a number"))  
fib(n)
```

Output:
Enter a number 7
0
1
1
2
3
5
8
13

14) WAP to calculate the volume of cuboid using keyword arguments:

```
* def vol(l, b, h):  
    print("Volume of cuboid = ", l*b*h)  
  
vol( l=10, w=10, h=20)
```

O/P:
Volume of
cuboid = 2000

15) WAP to print the following pattern using default arguments:

```
* def pat(r, p="*")  
    for i in range (r, 0, -1)  
        for j in range (0, i):  
            print (p, end = " ")
```

*** ***
** * *
* *

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```
print(" ")
n = int(input("Enter the no. of rows"))
pat(n)

}
O/P:
Enter the no. of rows 5
*****
****
 ***
 **
 *
 *
```

- 16) WAP to return the average of its arguments. The program should use doc-string & variable length arguments & add the values passed and find average.

```
def avg(*sum):
```

""" This program prints the average of the arguments """

```
count = 0
```

```
s = 0
```

```
for i in range num:
```

```
s += i
```

```
count += i
```

```
avg = s / count
```

```
print ("Average of the given arguments is", avg).
```

```
avg(7, 5, 8, 9, 16)
```

```
avg(8, 12, 52, 41, 11, 29, 26)
```

```
print (avg.__doc__)
```

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Output:

Average of the given arguments is 9.0.

Average of the given arguments is 25.571428

This program prints the average of the arguments.

Q) WAP to calculate S.I. Suppose the customer is senior citizen; he is been offered 12% of interest and for all the remaining customers; rate of interest is 10%.

```
* def si(p,t,a):  
    if (a>=60):  
        r=12  
        i = (p*r*t)/100  
        print ("Interest is ",i)  
    else:  
        r=10  
        i = (p*r*t)/100  
        print ("Interest is ",i)  
a=int(input("Enter your age"))  
p=float(input("Enter the principal")).  
t=float(input("Enter the time period"))  
si(p,t,a).
```

Output:

Enter your age 18

Enter the principal 5000

Enter the time

period 5

Interest is 2500.0