

VASAVI COLLEGE OF ENGINEERING

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

DEPARTMENT OF

: CSE

NAME OF THE LABORATORY : PP LAB

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PRELAB QUESTIONS-1

1) What is the difference between interactive mode and script mode in python?

A:

INTERACTIVE MODE

- 1) Interactive mode is used when an user wants to run one single line or one block of code.
- 2) Not recommended because it cannot be saved.

SCRIPT MODE

- 1) Script mode is used when the user is working with more than one single code or block of code.
- 2) A long piece of code should be written in this mode.

2) What are features of python?

A: Easy to code, free and open source, object oriented language, High level language, portable and integrated language, dynamically-typed language, Huge library

3) What are operators in python? Mention it and give bitwise operators with examples.

A: Different operators in python:

- 1) Arithmetic Operators: +, -, *, /, %, **, //
- 2) Relational Operators: >, <, !=, >=, <=, ==, !=
- 3) Logical operators: and, or, not
- 4) Bitwise Operators: &, |, ^, <<, >>, ~

Example of Bitwise operators:

$$X = 10 = 00001010 \quad Y = 4 = 00000100$$

- 1) & : Bitwise AND : $x \& y = 00000000$
- 2) | : Bitwise OR : $x | y = 00001110$
- 3) ~ : Bitwise NOT : $\sim x = \sim 10 = 11110101$
- 4) ^ : Bitwise XOR : $x ^ y = 14 = 00001110$
- 5) >> : Bitwise right shift : $x >> 1 = 00000010 = 2$
- 6) << : Bitwise left shift : $x << 2 = 00101000 = 40$
- 5) Assignment operators : =, +=, -=, *=, /=, %=, //= ..
- 4) What are variables and expression in python? What are the rules for naming variables?
A: A variable is a symbolic name that is a reference or pointer to an object.
An expression is a combination of operators and operands that is interpreted to produce some other value.
- ⇒ Rules for naming variables:
 - 1) Variable name should only contain alphabets, digits, underscore
 - 2) Name should not begin with a digit.
 - 3) Name can be in both uppercase & lowercase and both are interpreted to be different.
 - 4) The variable name should not match with the key words.

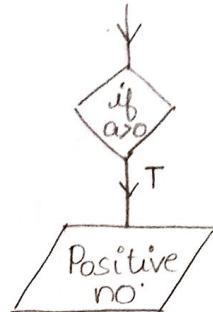
5) What are conditional statements in python ? Write each one of the statements with examples along with flowchart.

A: 1)

if statement :

if (cond):

statements



Ex: if (a > 0):

print ("Positive no")

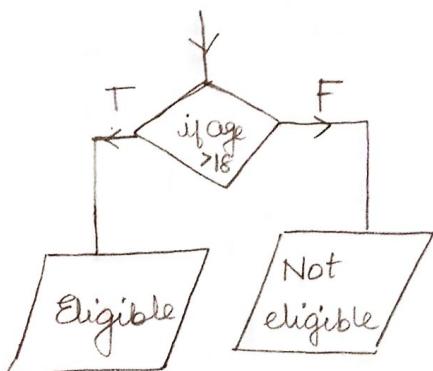
2) if else statement :

if (cond):

statements

else:

statements



Ex: if (age > 18):

print ("Eligible")

else : print ("Not Eligible")

3) Nested if statement :

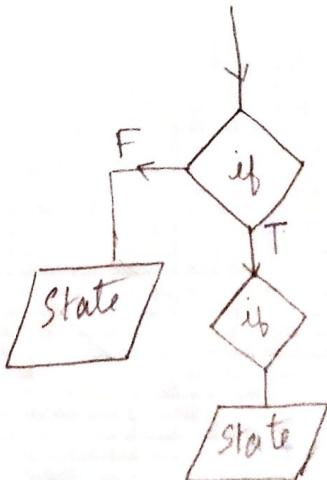
if cond1:

if cond2:

statements

else :

statements



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4) if-elif-else statement:

```
if (exp1):  
    Statement  
elif (exp2):  
    Statement  
else:  
    Statement
```

6) What are nested statements in python? Give example.

A: A nested statement is when a conditional statement is placed in another conditional statement.

```
if (cond1):  
    if (cond2):  
        statements  
    else:  
        statements
```

PRELAB PROGRAMS - 1

1) Program to enter the marks of 5 subjects of a student. Compute the total and average mark of the student and display it.

```
* print ("Enter 5 subject marks")  
a = int(input())  
b = int(input())  
c = int(input())  
d = int(input())
```

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e = int(input())

total = a + b + c + d + e

avg = total / 5

print("Total marks =", total)

print("Averge Mark =", avg)

Output:

Enter 5 subject marks

21

24

30

28

29

Total marks = 132

Average Mark = 26.4

2) Swap two given numbers.:

a) using temporary variable.

print("Enter 2 numbers")

a = int(input())

b = int(input())

t = a

a = b

b = t

print(a, b)

Output:

1) Enter 2 numbers

5

10

10, 5

b) Without using temporary variable:

print("Enter 2 numbers")

a = int(input())

b = int(input())

a, b = b, a

print(a, b)

2) Enter 2 numbers.

15

20

20, 15

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- 3) Program to find the square and square root of the given number.

* print &n

```
* b = int(input("Enter a number:"))
print("Square of given number:", b**2)
print("Square root of given number:", b**(0.5))
```

Output :-

Enter a number :

⁷ Square of given number : 49

Square root of given number: 2.6457513110645907.

- 4) Check whether the triangle is acute, obtuse or right angled by entering 3 sides of triangle.

```
print("Enter the 3 sides of triangle")
```

~~a = int(input())~~

```
b = int(input())
c = int(input())
```

if (($a^{**2} = b^{**2} + c^{**2}$) || ($b^{**2} = a^{**2} + c^{**2}$) ||

```
print("Triangle is right angled");
```

```
elif ((a**2 < b**2 + c**2) || (b**2 < a**2 + c**2) ||  
      (c**2 < a**2 + b**2)):
```

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```
point ("Triangle is acute angled")
else if ((a**2 > b**2 + c**2) || (b**2 > a**2 + c**2) ||  

        (c**2 > b**2 + a**2)):
    point ("Triangle is obtuse angled").
```

else:
 point ("None of the above")

Output:

1) Enter the 3 sides of a triangle.

3
4
5

Triangle is right angled.

2) Enter the 3 sides of triangle.

4
9
9

81 > 65
49 < 97
16 < 130

Triangle is acute - angled.

3) Enter the 3 sides of triangle.

7
2
4

Triangle is obtuse angled

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5) Implement a program to check whether given year is leap year or not.

```
* print ("Enter a year to be checked")
n=int(input())
if (n % 4 == 0):
    print ("leap year")
else:
    print ("Not a leap year")
```

Output:

1) Enter a year to be checked	2) Enter a year to be checked
2002	2004
Not a leap year.	Leap year.

6) Program to find the factorial of the given number:

```
n = int(input("Enter a number"))
f = 1
for i in range(1, n+1):
    f = f * i
print("Factorial of " + str(n) + " is = " + str(f))
```

Output:

Enter a number

6
Factorial of 6 is = 720

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7) Python program to implement Fibonacci Series:

```
print("FIBONACCI SERIES")
n = int(input("Enter no. of terms = "))
t1 = 0 ; t2 = 1 ; print(t1, "\n", t2)
for i in range(2, n+1):
    next = t1 + t2
    print(next)
    t1 = t2
    t2 = next
```

Output:

```
FIBONACCI SERIES
Enter no. of terms=6
0
1
1
2
3
5
8
```

8) Program to evaluate Taylor Series: $1 + \frac{x}{1!} + \frac{x^2}{2!} + \dots$

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LAB PROGRAMS - 1

- * AIM: Programs to illustrate the basic syntax of python language.

PROBLEM STATEMENTS:

- 1) Write a program to display your biodata :

Program: (Script Mode)

```
print("BIODATA")
name = input("Enter your name")
print("NAME:", name)
dob = input("Enter your date of birth")
print("DOB:", dob)
age = input("Enter your age")
print("AGE:", age)
mno = input("Enter your mobile number")
print("MOBILE NO:", mno)
```

Output:

BIODATA

Enter your name Sivani

NAME: Sivani

Enter your date of birth 07/01/2004

DOB: 07/01/2004

Enter your age 18

AGE: 18

Enter your mobile number 9391616262

MOBILE NO: 9391616262

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- 2) Write a program to implement the basic arithmetic operations in interactive mode.

*
>>> a = 5
>>> b = 10
>>> a+b
15
>>> a-b
-5
>>> a*b
50
>>> a/b
0.5
>>> a**b
9765625
>>> a//b
0
>>> a%b
5

- 3) Write a program to check whether the triangle is equilateral / scalene / isosceles.

Ans: Program:

```
print ("Enter the 3 sides of a triangle").  
a = input()  
b = input()  
c = input()  
if ((a==b) and (b==c)):  
    print ("Given sides form an equilateral triangle")
```

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if ((a==b) or (b==c) or (c==a)):
 point ("Given sides form an isosceles triangle ")

else:
 point ("Given sides form a scalene triangle ")

Output:

1) Enter the three sides of a triangle

12
15
16

Given sides form a scalene triangle

2) Enter the three sides of a triangle

10
18
10

Given sides form an isosceles triangle

3) Enter the three sides of a triangle

15
15
15

Given sides form an equilateral triangle

4) Write a program to check whether the given number is a +ve/-ve number (or) zero.

Program:

n = int(input("Enter a no"))

if (n > 0):

 print ("Given number is a positive number")

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elif($n == 0$):

 print ("Given number is zero")

else:

 print ("Given number is a negative number")

Output:

1) Enter a number 25

Given number is a positive number.

2) Enter a no -78

Given number is a negative number

3) Enter a no 0

Given number is zero

5) Write a program to calculate the area of triangle using Heron's formula:

Program:

print("Area of triangle using heron's formula")

print("Enter the sides of triangle").

a = float(input())

b = float(input())

c = float(input())

s = (a+b+c)/2

area = (s * (s-a) * (s-b) * (s-c)) ** (0.5)

print ("Area of the triangle = ", area).

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Area of triangle using heron's formula

Enter the sides of triangle

1

1

1

Area of triangle = 0.4330127018922193

- 6) Write a program to find the greatest among the 3 numbers:

Program:

```
print("Enter 3 numbers")
a=int(input())
b=int(input())
c=int(input())
if(a>b and a>c):
    print(a,"is greatest")
elif (b>a and b>c):
    print(b,"is greatest")
else:
    print(c,"is greatest")
```

Output:

Enter 3 numbers.

15

5

20

20 is greatest

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- 7) Write a program to enter the marks of student in 4 subjects. Calculate the total, % and display the grade obtained by student. If student scores:

above 75% : distinction ; $\geq 60\%$ & $< 75\%$: 1st distinction
 $\geq 50\%$ & $< 60\%$: 2nd distinction ; $\geq 40\%$ & $< 50\%$: 3rd distinction
 $< 40\%$: fail

Program:

```
print("Enter your 4 Subject marks")
a = int(input())
b = int(input())
c = int(input())
d = int(input())
total = a+b+c+d
print("Total marks =", total)
per = total/4
print("Percentage =", per)
print("Your grade : ")
if (per > 75):
    print("Distinction ")
elif (per >= 60 and < 75%):
    print("First Distinction")
elif (per >= 50 and < 60%):
    print("Second Distinction")
```

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elif (per>=40 and per<50):
 print("Third distinction")

else:
 print("Fail").

Output:

Enter your 4 subject marks

95
80
90
100

Total marks = 365

Percentage = 91.25

Your grade :

Distinction

8) Write a program whether given no is palindrome (or) not.

Program:

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

num=n

rev=0

while (num!=0):

 rem=num%10

 num//=10

 rev=rev*10+rem

if (rev==n):

 print("Palindrome")

else:

```
    print("Not a Palindrome")
```

Output:

- 1) Enter a number 121
Palindrome
- 2) Enter a number 43
Not a Palindrome

- 3) Write a program to display multiplication table of a given no.

Program:

```
print("Multiplication table")
n = int(input())
for i in range(1, 11):
    print(n, "*", i, "=", n * i)
```

Output:

Multiplication table:

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

1) Write a program to check whether given no is prime(or) not:

Program:

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

```
flag = 0
```

```
for i in range(2, n):
```

```
    if (n % i == 0):
```

```
        flag = 1
```

```
        break
```

```
if (flag == 0):
```

```
    print("Given number is prime").
```

```
else:
```



```
    print("Given number is not prime")
```

Output:

1) Enter a number 13

Given number is prime

2) Enter a number 45

Given number is not prime.

III) Display even and odd numbers upto the given limit:

Program:

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

```
print("Even numbers:")
```

for i in range(1, n+1):

 if (i % 2 == 0):

 print(i, end=" ")

print("Odd numbers")

for i in range(0, n+1):

 if (i % 2 != 0):

 print(i, end=" ")

Output:

Enter the limit : 20

Even numbers: 2 4 6 8 10 12 14 16 18 20.

Odd numbers:

1 3 5 7 9 11 13 15 17 19

12) Write a program to display the sum of series $1^2 + 2^2 + \dots + n^2$.

Program:

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

s = 0

for i in range(1, n+1):

 s += i * i

print("Sum of series =", s)

Output:

Enter a number 6

Sum of series = 91

13) Write a program to calculate the sum of digits of a given no.

Program:

```
n = int(input("Enter a number"))
num = n
s = 0
while (num != 0):
    rem = num % 10
    num //= 10
    s += rem
print("Sum of digits = ", s)
```

Output:

Enter a number 135
Sum of digits = 9.

14) Write a program to display armstrong number:

Program:

```
n = int(input("Enter a number"))
num = n
s = 0
while (num != 0):
    rem = num % 10
    s += (rem)**3
if (s == n):
    print("Armstrong number")
else:
    print("Not a armstrong number")
```

Output:

Enter the number 153
Armstrong number

Enter the number 135
Not a armstrong number.

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15) Write a program to calculate GCD & LCM:

Program:

print("Enter 2 numbers")

a = int(input())

b = int(input())

min = 0

GCD = 0

if (a > b):

 min = b

else:

 min = a

for i in range(1, min):

 if (a % i == 0 and b % i == 0)

 GCD = i

print("GCD of given 2 numbers is", GCD)

LCM = (a * b) // GCD

print("LCM of given 2 numbers is", LCM)

16) WAP to display even nos in reverse order from 50 to 10.

Program:

for i in range(50, 9, -1):

 if (i % 2 == 0)

 print(i, end=" ")

Output:

50, 48 46 44 42 40 38 36 34 32 30 28 26 24 22 20 18 16 14 12

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Q) WAP to calculate amount in piggy bank if denotions are
₹10, ₹5, ₹2, ₹1.

Program:

```
a = int(input("Enter no of ₹10 coins = "))  
b = int(input("Enter no of ₹5 coins = "))  
c = int(input("Enter no of ₹2 coins = "))  
d = int(input("Enter no of ₹1 coins = "))  
total = a + b + c + d. total = 10*a + 5*b + 2*c + d*1  
print("Total pocket money = ", total).
```

Output:

Enter no of ₹10 coins = 2

Enter no of ₹5 coins = 3

Enter no of ₹2 coins = 6

Enter no of ₹1 coins = 4

Total pocket money = 51