

## Basic Assignment

Q1. What will be output of printing following calculations

a.  $1.5e200 * 2.0e210$

b.  $3.4e-320 / 1e100$

Explain the output

**a. Infinity**

**b. 0.0**

Q2. What is output of printing following

a.  $1/3$

b. `format(1/3, '.3f')`

c. `format(1/3, '.1f')`

d.  $6 * 1/3$

e.  $1/3 + 1/3 + 1/3 + 1/3 + 1/3 + 1/3$

**a. 0.3333333333333333**

**b. 0.333**

**c. 0.3**

**d. 2.0**

**e. 1.6666666666666665**

Q3. In above question what is difference between output of a and b ? also, d and e?

a. In b the output prints upto 3 decimal places

b. In d associativity rules applies because its associativity is left to right, whereas in e precedence rule is applied

Q4. Study how format function works to print floating point values and strings . Then solve following using format function

a. print only first 5 decimal values of  $22/7$  (hint: see b of Q3)

b. print Hello string with 5 spaces on right side, 'Hello ' ( hint: use <)

c. print Hello string with 5 spaces on left side, ' Hello' ( hint: use >)

d. print Hello string with 5 '#' on left side and 5 '#' on right side, ' Hello ' ( hint: use ^ and # as fill value)

e. print 10 spaces (hint: give 10 as argument)

```
print(format(22/7, '.5f'))
print(format('Hello', '<10'))
print(format('Hello', '>10'))
print(format('Hello', '#^15'))
print(format(' ', '^10'))
```

Q5. We can use ord() to print ASCII value of single character and chr() to convert given ASCII value to character.

- find ASCII of characters 'a' , 'A' , 'z' , 'Z' using ord() one by one
- find ASCII of characters '0' , '9' , ' ' , "\n" , "\t" using ord() one by one
- Find characters for ASCII values 35, 67, 50, 99
- Where ASCII value begin for lower case characters where it ends? also find same for digits and upper case characters

```
print(ord('a'))
print(ord('z'))
print(ord('A'))
print(ord('Z'))

print(ord('0'))
print(ord('9'))
print(ord(' '))
print(ord('\n'))
print(ord('\t'))
```

Q6. Find how special characters work inside print function

- print("abc","\n","bcd")
- print("abc\nbcd")
- print(1,'\n',2)
- print("hello \n\n!!")
- print("This is '\t' means tab")
- How many spaces are printed using \t?
- print("This","is","different",sep='\t')
- print("This","is","different",sep='#')
- print("This","is","different",sep='\n')
- print("This","is","different",end='\n')

```
print("abc", "\n", "bcd")
print("abc\nbcd")
print(1, '\n', 2)
print("hello \n\n!!")
print("This is '\t' means tab")

# # How many spaces are printed using \t?
print("This", "is", "different", sep='\t')
print("This", "is", "different", sep='#')
print("This", "is", "different", sep='\n')
```

```
print("This", "is", "different", end='\n')
```

Q7. What is output of following statements and understand how operators work

- a.  $10 / 2$
- b.  $10 // 2.0$
- c.  $101 / 3$
- d.  $101 // 3$
- e.  $101 \% 3$
- f.  $2 ** 4$
- g.  $3 ** 2$
- h. `abs(-10)` # give absolute value
- i. `divmod(101,3)` # divmod gives two values , interger division and remainder
- j.  $8 << 1$
- k.  $8 << 2$
- l.  $32 >> 2$
- m.  $16 >> 1$

```
=====
5.0
5.0
33.666666666666664
33
2
16
9
10
(33, 2)
16
32
8
8
=====
```

Q8. Write a program to take marks of 3 subjects from a student. Calculate total in variable name 'total'.

(NOTE: Don't use sum as variable name, it is built in function in python)

```
=====
mark1 =input("enter marks of subject 1 : ")
mark2 =input("enter marks of subject 2 : ")
mark3 =input("enter marks of subject 3 : ")
total = int(mark1) + int(mark2) + int(mark3)
print(total)
```

=====

Q9. Manually calculate output of following expressions using precedence and associativity rules and then verify output using python shell

- a.  $2 + 3 * (4 - 1)$
- b.  $2 + ((3 * 4) - 8)$
- c.  $(2 + 3) * 4$
- d.  $-10 + 25 / (16 + 12)$
- e.  $2 ** 2 ** 2$
- f.  $(3 ** 2) ** 3$
- g.  $x = y = 3 + 5$
- h.  $8/2*(2+2)$

- a. 11
- b. 6
- c. 20
- d. -9.107142857142858
- e. 16
- f. 729
- g. Syntax error
- h. 16.0

Q10. Check output of following

- a.  $x = y = 10$
- b.  $x1 = 20 = y1$

- a. **SyntaxError:** invalid syntax
- b. SyntaxError: invalid syntax
- c.

Q11. What is output of following

- a.  $x=10$   
 $y=34.4$   
`print(x and y)`  
`print(x or y)`

34.4  
10

## If-Else Questions :

1. A student will not be allowed to sit in exam if his/her attendance is less than 75%. Take following input from user Number of classes held Number of classes attended. And print percentage of class attended  
Is student is allowed to sit in exam or not.

```
=====
total =input("total number of classes held : ")
attend =input("number of class attended : ")
attendance = (int(attend)/int(total))*100
print("percentage of class attend :",attendance,"%")
if attendance > 75:
    print("student is allowed to sit")
else:
    print("student is not allowed to sit")
```

- ```
=====
```
2. accept amount from user and find the minimum number notes required to get the amount  
amount =512  
Notes: 2000,500,100,50,10,5,2,1

500-1 note

10 - 1 note

2- 1 coin

amount=20550

2000 – 10 note

500 – 1 note

50 -1 note

```
=====
price = input("input the number : ")
amount=int(price)
if amount>=2000:
    two_thou = amount//2000
    print("2000 -",two_thou,"note")
    amount=amount-(2000*two_thou)
if amount>=500:
    five_hun = amount//500
```

```

        print("500 -", five_hun, "note")
        amount=amount-(500*five_hun)
if amount>=100:
    one_hun = amount//100
    print("100 -", one_hun, "note")
    amount=amount-(1000*one_hun)
if amount>=50:
    fifty = amount//50
    print("50 -", fifty, "note")
    amount=amount-(50*fifty)
if amount>=10:
    ten = amount//10
    print("10 -", ten, "note")
    amount=amount-(10*ten)
if amount>=5:
    five = amount//5
    print("5 -", five, "note")
    amount=amount-(5*five)
if amount>=2:
    two = amount//2
    print("2 -", two, "note")
    amount=amount-(2*two)
if amount == 1:
    one = amount//1
    print("1 -", one, "coin")
    amount=amount-(1000*one)

```

=====

3. Modify the above question Q1 to allow student to sit if he/she has medical cause. Ask user if he/she has medical cause or not ( 'Y' or 'N' ) and print accordingly.

```

total =input("total number of classes held : ")
attend =input("number of class attended : ")
medical =int(input("do you have a medical condition\n type 1 for yes, 0
for no : "))
attendance = (int(attend)/int(total))*100
print("percentage of class attend :",attendance,"%")
if attendance > 75:
    print("student is allowed to sit")

```

```
elif attendance < 75 and medical == 1:
    print("student is allowed to sit")
else:
    print("student is not allowed to sit")
```

=====

4. A school has following rules for grading system:

- a. Below 25 - F
- b. 25 to 45 - E
- c. 45 to 50 - D
- d. 50 to 60 - C
- e. 60 to 80 - B
- f. Above 80 - A

Ask user to enter marks and print the corresponding grade.

=====

```
marks = int(input("enter your marks :"))
if marks >= 80:
    print("Grade A")
elif marks >= 60:
    print("Grade B")
elif marks >= 50:
    print("Grade C")
elif marks >= 45:
    print("Grade D")
elif marks >= 25:
    print("Grade E")
else:
    print("Grade A")
```

=====

5. If  $x = 2$   $y = 5$   $z = 0$  then find values of the following expressions and Print the output of following statements

- a.  $x == 2$
- b.  $x != 5$
- c.  $x != 5 \& y >= 5$
- d.  $z != 0 \mid x == 2$
- e.  $\text{not}(y < 10)$

- a. True
- b. True
- c. True
- d. True
- e. False

6. Accept number from user and check whether it is divisible by 5 and 11 if divisible then display appropriate message.

```
num = int(input("enter the number :"))
if num%5==0:
    print("number is divisible by 5")
elif num%11==0:
    print("number is divisible by 11")
else:
    print("number is not divisible by 5 or 11")
```

7. Write a program to calculate the electricity bill (accept number of unit from user) according to the following criteria :

| Unit            | Price          |
|-----------------|----------------|
| First 100 units | no charge      |
| Next 100 units  | Rs 5 per unit  |
| After 200 units | Rs 10 per unit |

(For example if input unit is 350 than total bill amount is Rs2000)

```
unit = int(input("total unit :"))
if unit > 200:
    bill = (unit-200)*10 + 100*5
    print("your bill is: ", bill)
elif unit>100:
    bill=(unit-100)*5
    print("your bill is: ",bill)
else:
    print("no charge")
```



### Alternative

```
unit=350
bill =0
if unit >200:
    bill=(unit-200)*10
    unit=200
if unit >100:
    bill=bill+(unit-100)*5
print("bill :",bill)
```

=====

8. Write a program to check whether the last digit of a number( entered by user ) is divisible by 3 or not.

=====

```
num = int(input("enter number :"))
remainder = num%10
if remainder%3 == 0 and remainder != 0:
    print("divisible by 3")
else:
    print("not divisible ")
```

=====

9. Write a program to check whether an years is leap year or not the year is leap if it satisfies following condition

- It the year is divisible by 100 o If it is divisible by 100, then it should also be divisible by 400 then it is leap year
- otherwise, all other years divisible by 4 and not divisible by 100 then it is leap year.

=====

```
year=int(input("enter year: "))
if (year%400==0):
    print("leap year")
elif(year%4==0 and year%100!=0):
    print("leap year")
else:
    print("not a leap year")
```

=====

10. Write a program to accept the price of a bike and display the road tax and insurance to be paid according to the following criteria . also display total amount to be paid.

| Cost price (in Rs) | Tax  | Insurance |
|--------------------|------|-----------|
| > 100000           | 15 % | 20%       |

|                       |     |    |
|-----------------------|-----|----|
| > 50000 and <= 100000 | 10% | 8% |
| <= 50000              | 5%  | 5% |

=====

```
price=int(input("whats the cost of the bike :"))
if price>100000:
    tax = 15*price/100
    insurance=20*price/100
    print("total cost :",tax+insurance)
elif price>50000:
    tax = 10*price/100
    insurance=8*price/100
    print("total cost :",tax+insurance)
else:
    tax = 5*price/100
    insurance=5*price/100
    print("total cost :",tax+insurance)
```

=====

## Loop Questions:

1. Accept 10 integers from user and print their average value on the screen

```
sum=0
for i in range(10):
    num=int(input("enter number :"))
    sum=sum+num
average=sum/10
print("total sum : ",sum)
print("average : ",average)
```

=====

2. Print the following patterns using loop :

```
a.
*
**
***
****
```

=====

```
for i in range(1,5):
    for j in range(0,i):
```

```

    print("*", end = "")
    print("\n")

```

=====

b.

```

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

```

=====

```

for i in range(-4,5,2):
    for j in range(0,abs(i)):
        print(" ",end="")
    for k in range(0,5-abs(i)):
        print("*",end="")
    print("\n")

```

=====

c.

```

1010101
10101
101
1

```

=====

```

m=1
n=8
for j in range(1,5):
    if m >1:
        for k in range(1,m):
            print(" ",end="")
    for i in range(m,n):
        if j%2==1:
            if i%2==1:
                print("1",end="")
            else:
                print("0",end="")
        if j%2==0:
            if i%2==0:
                print("1",end="")
            else:
                print("0",end="")
    m=m+1

```

```
n=n-1
print("\n")
```

```
=====

d.
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

```
=====
for i in range(1,6):
    for j in range(0,i):
        print(j+1,end=" ")
    print("\n")
=====
```

3. Write a program to find greatest common divisor (GCD) or highest common factor (HCF) of given two numbers.

```
=====
a=int(input("enter number 1"))
b=int(input("enter number 2"))
if a==b:
    print("GCF is ",a)
elif(a<b):
    if(b%a==0):
        print("gcf is ",a)
    for i in range(2,a//2+1):
        if a%i==0 and b%i==0:
            gcf=i
else:
    if(a%b==0):
        print("gcf is ",b)
    for i in range(2,b//2+1):
        if a%i==0 and b%i==0:
            gcf=i
print("gcf is : ",gcf)
```

```
=====

4. Take integer inputs from user until he/she presses q ( Ask to press q to quit after every integer input ). Print average and product of all numbers.

=====
```

```

char='b'
i=0
sum=0
while (char!='q') and (char!='Q'):
    num=int(input("enter a number"))
    i=i+1
    sum=sum+num
    char=input("press any character to continue or, q or Q to to exit ")
print("sum is ",sum)
print("average is ",sum/i)

```

=====

5. Given a number count the total number of digits in a number and also find sum of digits of the number.

=====

```

num=int(input("enter a number"))
sum=0
i=0
while (num!=0):
    sum=sum+(num%10)
    num=num//10
    i=i+1
print("your sum is : ",sum)
print("total number of digits", i)

```

=====

6. To display the cube of the number upto given an integer. If the given integer is 5, then display cube of 1 to 4.

=====

```

num=int(input("enter the number"))
for i in range(1,num):
    print("cube of ",i," :",i*i*i)

```

=====

7. Accept 20 numbers from user and display sum of only even numbers.

=====

```

sum=0
for i in range(20):
    num=int(input("enter a number: "))
    if num%2==0:

```

```

sum=sum+num
print("sum of even number :", sum)

```

=====

8. Ask user number of terms to be generated of a series.  
generate numbers for the following series and find its addition  
[9 + 99 + 999 + 9999+.....]

=====

```

num=int(input("number of terms to be generated in series [9 + 99 + 999 + 9999+.....] :"))
sum=0
for i in range(1,num+1):
    sum=10**i-1+sum
print("total sum is :",sum)

```

=====

9. Write a program in python to display the sum of the series [  $1+x+x^2/2!+x^3/3!+....$  ]. Go to the editor

Test Data :

Input the value of x :3 Input number of terms : 5 Expected Output :

The sum is : 16.375000

=====

```

# 1+x+x^2/2!+x^3/3!+....
# Tn=x**(n-1)/factorial(n-1)
import math
sum=0
# x=3
# n=5
print("function is 1+x+x^2/2!+x^3/3!+....")
x=int(input("enter x :"))
n=int(input("enter n :"))
for i in range(1,n+1):
    Tn=x**(i-1)/math.factorial(i-1)
    sum=sum+Tn
print("total sum",sum)

```

=====

10. Write a program in python to find the sum of the series [  $x - x^3 + x^5 - x^7 + x^9 - x^{11} + .....$  ]. Go to the editor

Test Data :

Input the value of x :2 Input number of terms : 5 Expected Output :

The values of the series:

2

-8  
32  
-128  
512  
The sum = 410

```
=====
print("for equation 1+x+x^2/2!+x^3/3!+.... ")
#Tn=(-1)**((n-1)%2)*x**(2*n-1)
x=2
n=5
sum=0
for i in range(1,n+1):
    Tn=(-1)**((i-1)%2)*x**(2*i-1)
    sum=sum+Tn
print("total sum: ",sum)
=====
```

11. Take a number from user and check if it is prime or not

```
=====
import math
num=11

for i in range(2,math.floor(math.sqrt(num))+1):
    if(num%i==0):
        print("not a prime")
        break
else:
    print("prime")
=====
```

12. Take a number from user and print sum of all odd numbers till that number.

Ex. Enter a no : 10

Sum of all odd numbers till 10 : 3+5+7+9 =24

```
=====
num=10
sum=0
for i in range(2,11):
    if i%2==1:
        sum=sum+i
print("sum of all odd number till",num,":",sum)
=====
```

Advanced questions

Q. Create a variable storing integer value. Print the identity of that variable. Then change value of that variable and again print the identity.

Observe both values, what is your conclusion?

Q. What is PEMDAS rule ? What is BODMAS ? Is there any difference in them ?

Q. What is PEMDAS vs PEDMAS ? is there any difference?