

Minor Assignments - 2

Functions

Q1) What will be the output produced by each of the following function calls:-

- `math.ceil(65.65)`
- `math.ceil(65.47)`
- `math.fabs(-67.58)`
- `math.fabs(3)`
- `math.exp(2.7)`
- `math.log(45, 2)`
- `math.log10(1000)`
- `math.pow(4, 1/2)`
- `math.sqrt(121)`
- `math.radians(30)`
- `math.degrees(math.pi/2)`

Program :-

```
import math
print(math.ceil(65.65))
print(math.ceil(65.47))
print(math.fabs(-67.58))
print(math.fabs(3))
print(math.exp(2.7))
print(math.log(45, 2))
print(math.log10(1000))
print(math.pow(4, 1/2))
print(math.sqrt(121))
print(math.radians(30))
print(math.degrees(math.pi/2))
```

Output :-

```
66 66 67.58 3.0 14.879731784818837 5.4918530963
29675 3.0 2.0 11.0 0.5235987755982988 90.0
```

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Q2) Give the range in which value of variable x may lie on execution of the following statements:

`import random`

`x = random.random() + 5`

Program :-

`import random`

`x = random.random() + 5`

`print(x)`

Output :-

5.804313891637484

Q3) Evaluate the following expressions using Python shell. Assume that ASCII coding scheme is used for character data.

a) `abs(-5.4)`

b) `abs(15)`

c) `chr(72)`

d) `round(-24.9)`

e) `float(57)`

f) `complex('1+2j')`

g) `divmod(5, 2)`

h) `float(57)`

i) `pow(9, 2)`

j) `max(97, 88, 60)`

k) `min(55, 29, 99)`

l) `max('a', 'b', 'AB')`

Program :-

`print(abs(-5.4))`

`> abs(15)`

`> chr(72)`

`> round(-24.9)`

`> float(57)`

```
> complex ('1+2j')  
> divmod (5, 2)  
> float (57)  
> pow (9, 2)  
> max (97, 88, 60)  
> min (55, 29, 99)  
> max ('a', 'b', 'AB'))
```

Output:-

5.4 15 H -25 57.0 (1+2j) (2, 1) 57.0 81 97 29 b

Q4) consider the following function :

```
def nMultiple (a=0, num=1):
```

```
    return a * num
```

what will be the output produced when the following calls are made :

- nMultiple (5)
- nMultiple (5, 6)
- nMultiple (num=7)
- nMultiple (num=6, a=5)
- nMultiple (5, num=6)

Program :-

```
def nMultiple (a=0, num=1):
```

```
    return a * num
```

```
print (nMultiple (5))
```

```
print (nMultiple (5, 6))
```

```
print (nMultiple (num=7))
```

```
print (nMultiple (num=6, a=5))
```

```
print (nMultiple (5, num=6))
```

Output:-

5
30

0
30
30

Q5) Develop Python functions to produce the following outputs

a)

```

      *
    * * *
  * * * * *
    * * *
      *
  
```

b)

```

$ $ $ $ $
$           $
$           $
$           $
$ $ $ $ $
  
```

Program :-

```
print(''
```

```

      *
    * * *
  * * * * *
    * * *
      *
  ''')
  
```

```
print(''
```

```

$ $ $ $ $
$           $
$           $
$           $
$ $ $ $ $
  ''')
  
```

output :-

```

      *
    * * *
  * * * * *
    * * *
      *
  
```

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\$ \$ \$ \$ \$
\$ \$
\$ \$
\$ \$
\$ \$ \$ \$ \$

Q6) study the program segments given below. Give the output produced if any,

a) def test (a,b):
 a = a + b
 b = a - b
 a = a - b
 print ('a = ', a)
 print ('b = ', b)
test (5,8)

b) def func():
 pass
a = func()
print (a)

Program :-

#a
def test (a,b):
 a = a + b
 b = a - b
 a = a - b
 print ('a = ', a)
 print ('b = ', b)
test (5,8)

#b
def func():
 pass
a = func()

print (a)

Output :-

a = 8
b = 5 None

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Q7) Write a function `areaTriangle` that takes the lengths of three sides: `side1`, `side2`, and `side3` of the triangle as the input parameters and returns the area of the whole triangle as the output. Also, assert that sum of the length of any two sides is greater than the third side. Write a function `main` that accepts inputs from the user interactively and computes the area of the triangle using the function `areaTriangle`.

Program :-

```
def areaTriangle(side1, side2, side3):  
    assert (side1 + side2 <= side3) or (side1 + side3 <= side2) or  
           (side2 + side3 <= side1)  
    s = (side1 + side2 + side3) / 2  
    return (s * (s - side1) * (s - side2) * (s - side3)) ** 0.5  
  
if __name__ == '__main__':  
    side1, side2, side3 = float(input('Enter length of side1: ')),  
                           float(input('Enter length of side 2: ')),  
                           float(input('Enter length of side 3: '))  
    print(areaTriangle(side1, side2, side3))
```

Output :-

```
Enter length of side 1 : 1  
Enter length of side 2 : 3  
Enter length of side 3 : 5  
(2.1045137462542978e-16 + 3.43693177121688j)
```

Q8) Write a function to print the table of entered number.

Program :-

```
def table(num):  
    for i in range(1, 11):  
        print(num, 'x', i, '=', num * i)  
  
if __name__ == '__main__':  
    table(int(input("Enter the number: ")))
```

Output :-

Enter the number: 2

$$2 \times 1 = 2$$

$$2 \times 2 = 4$$

$$2 \times 3 = 6$$

$$2 \times 4 = 8$$

$$2 \times 5 = 10$$

$$2 \times 6 = 12$$

$$2 \times 7 = 14$$

$$2 \times 8 = 16$$

$$2 \times 9 = 18$$

$$2 \times 10 = 20$$

Q9) Study the program segments given below. Give the output produced if any.

a) `def say (message, times = 2):`

`print (message * times)`

`say ('Hello')`

`say ('world', 5)`

b) `def fun(a=2, b=3, c=7):`

`d = a + b + c`

`print (d)`

`print (fun(2))`

Program :-

#a

`def say (message, times = 2):`

`print (message * times)`

`say ('Hello')`

`say ('world', 5)`

#b

`def fun(a=2, b=3, c=7):`

`d = a + b + c`

`print (d)`

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print(fun(2))

Output :-

HelloHello

WorldWorldWorldWorldWorld

1 2

None

Q10) Find the sum of even digits of a four-digit number using function.

Warning: Don't use control structures.

Program :-

```
num = int(input("Input a 4 digit number: "))
```

```
x = 0
```

```
digit = num // 1000
```

```
x += (1 - digit % 2) * digit
```

```
digit1 = (num - digit * 1000) // 100
```

```
x += (1 - digit1 % 2) * digit1
```

```
digit2 = (num - digit * 1000 - digit1 * 100) // 10
```

```
x += (1 - digit2 % 2) * digit2
```

```
digit3 = (num - digit * 1000 - digit1 * 100 - digit2 * 10)
```

```
x += (1 - digit3 % 2) * digit3
```

```
print(x)
```

Output :-

Input a 4 digit number: 2468

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Q11) Using a function evaluate the value of the arithmetic expression taken from the user.

Hint: Expression will act as an argument while defining function.

Program :-

```
def evaluate():
```

```
    print(eval(input("Enter an arithmetic expression: ")))
```

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evaluate()

Output :-

Enter an arithmetic expression: $5 + 2 - 8 * 6 / 2$
-17.0

Q12) What does a function return by default in Python? Define a function that does not return any value, store the function call in a variable and check the value of that variable.

Program :-

```
'''The default return value of function is always be None'''
```

```
def fun():
```

```
    pass
```

```
a = fun()
```

```
print(a)
```

Output

None

Q13) Write a function which takes co-ordinates of three points as input and returns true if points are collinear otherwise returns false.

Program :-

```
def collinear(x1, y1, x2, y2, x3, y3):
```

```
    a = x1 * (y2 - y3) + x2 * (y3 - y1) + x3 * (y1 - y2)
```

```
    if (a == 0):
```

```
        return (True)
```

```
    else:
```

```
        return (False)
```

```
x1, x2, x3, y1, y2, y3 = float(input("Enter x1 ")), float(input("Enter  
x2 ")), float(input("Enter x3 ")), float(input("Enter  
y1 ")), float(input("Enter y2 ")), float(input("Enter y3 "))
```

```
print(collinear(x1, y1, x2, y2, x3, y3))
```

Output :-

Enter x1 2

Enter x2 3

Enter x3 4
Enter y1 4
Enter y2 5
Enter y3 6
True.

Q14) Write a function named as 'uppercase' which converts the lower case alphabet to upper case alphabet. Also, assert that the entered by user is valid lowercase alphabet. Write a function main that accepts inputs from the user interactively and converts the lower case alphabet to upper case using the function 'uppercase'.

Program :-

```
def uppercase(str):  
    assert str.islower()  
    print(str.upper())  
if __name__ == '__main__':  
    uppercase(input("Enter lowercase alphabet:"))
```

Output :-

Enter lowercase alphabet : saswat
SASWAT

Q15) Observe carefully the below function

```
def fun (a=0, b=1):  
    return (a**2 + b**2)
```

What will be the output for each call made below?

a) fun (2, a=3)

b) fun (b=3, 2)

c) fun (3, b=2)

d) fun (a=4, 5)

Program :-

```
def fun (a=0, b=1):  
    return (a**2 + b**2)  
print (fun (2, a=3))  
print (fun (b=3, 2))
```

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```
print (fun (3, b=8))  
print (fun (a=4, 5))
```

Output :-

File "d:\1941012407\Minor Assignment - 2\A2015.py", line 4
print (fun (b=8, 2))

File "d:\1941012407\Minor Assignment - 2\A2015.py", line 6
print (fun (a=4, 5))

SyntaxError: positional argument follows keyword argument.

Q16) What will be the output of following code ?

```
x = -5  
def display(x):  
    print(x)  
    x = 5  
    print(x)  
display(x)  
print(x)
```

Program :-

```
x = -5  
def display(x):  
    print(x)  
    x = 5  
    print(x)  
display(x)  
print(x)
```

Output :-

```
-5  
5  
-5
```


Q17) what will be the output of the following Python code?
`int('89.67')`

- a) ImportError
- b) ValueError
- c) Type Error
- d) Name Error

Program :-

```
print(int('89.67'))
```

Output :-

Exception has occurred: ValueError
invalid literal for int() with base 10: '86.67'

Q18) create the following scripts `importedModule` and `mainModule` in the working directory, execute the script `mainModule` and justify the output.

- `importedModule.py`

```
def test1():  
    print('test1 in imported module')
```

```
def test2():  
    print('test2 in imported module')
```

```
test1()
```

```
test2()
```

- `mainModule.py`

```
import importedModule
```

```
print('hello')
```

Program :-

`importedModule.py` →

```
def test1():
```

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```
print('test1 in imported module')  
def test2():  
    print('test2 in imported module')  
test1()  
test2()
```

mainModule.py →

```
import importedModule as i  
print('hello')
```

Output:-

```
test1 in imported module  
test2 in imported module  
hello
```