

# CS & IT ENGINEERING



Python-For Data Science

Functions

DPP 01 Discussion Notes



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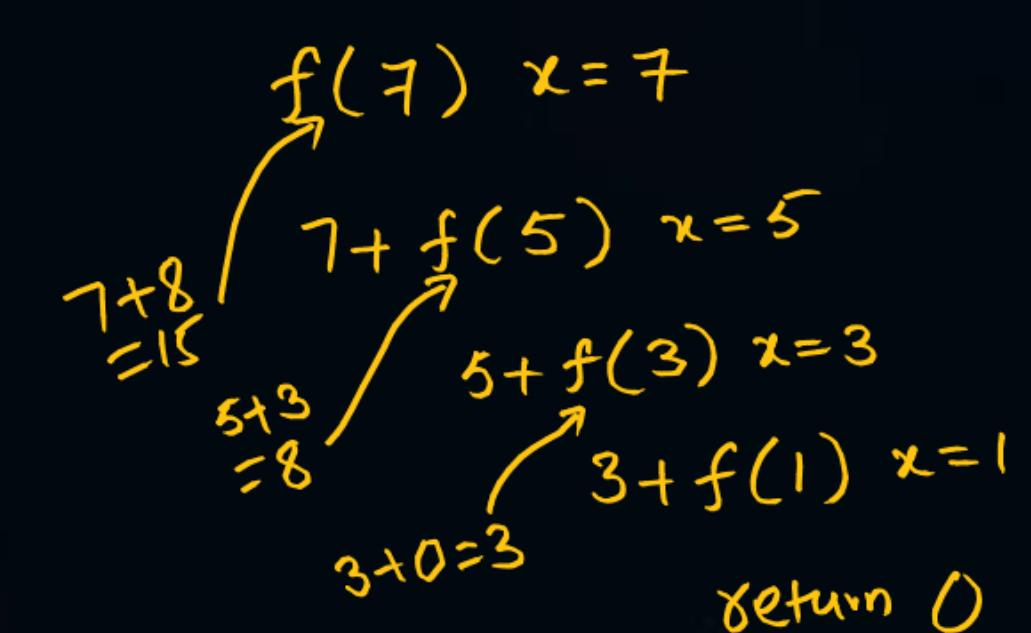
#Q. The return value of below function  $f(7)$  is 15

```
def f(x):
```

```
    if x<=1:
```

```
        return x-1
```

```
    return x + f(x-2)
```



## [MCQ]

#Q. The output printed by below code is \_\_\_\_\_

```
def fun(i, j):  
    if i==j:  
        print(i+j, end=" ")  
    else:  
        print(i-1, j, end=" ")  
        fun(i-2, j + 2)  
→ fun(12, 0)
```

fun(12, 0)  
→ Print 11 0  
fun(10, 2)  
→ Print 9 2  
fun(8, 4)  
→ Print 7 4  
fun(6, 6)

→ Print 12

O/p: 11 0 9 2 7 4 12

A

12 0 10 2 8 4 12

C ✓

11 0 9 2 7 4 12

B

11 1 9 3 7 5 12

D

12 1 10 3 8 5 12

# [MCQ]

#Q. The output printed by below code segment is \_\_\_\_\_

```
def function(i):
```

```
    if i<=0:
```

```
        return 0
```

```
        print(i-1,end='')
```

```
        function(i-2)
```

```
        print(i+1,end='')
```

```
→function(5)
```

o/p: 4 2 0 2 4 6

fun(5) i=5

Point 4  
fun(3) i=3

Point 6  
Point 2  
fun(1) i=1

Point 4  
Point 0

Point 2  
fun(-1)

A

5 3 1 3 5 7

C

5 3 1 2 4 6

B

4 2 0 2 4 6

D

5 3 1 1 3 5



#Q. Consider the below code:

```
def f(i):
    count = 1
    if i <= 0:
        return
    for x in range(i):
        k = count + g(x + 1)
        count = count + x
    return k
```

```
def g(i):
    j = 1
    if i < 1:
        return i + 1
    for x in range(i + 1):
        j = j + x
    return j
```

The return value of  $f(5)$  is Q3

$Count = 1$

$x = 0 \quad k = 1 + g(1) = 1 + 2 = 3, Count = 1 + 0 = 1$

$x = 1 \quad k = 1 + g(2) = 1 + 4 = 5, Count = 1 + 1 = 2$

$x = 2 \quad k = 2 + g(3) = 2 + 7 = 9, Count = 2 + 2 = 4$

$x = 3 \quad k = 4 + g(4) = 4 + 11 = 15, Count = 4 + 3 = 7$

$x = 4 \quad k = 7 + g(5) = 7 + 16 = 23, Count = 7 + 4 = 11$

$g(1) \stackrel{i=1}{=} 1$

$j=1 \quad x=0 \quad j=1+0=1$

$x=1 \quad j=2$

$x=2 \quad j=4$

$\text{return } 4$

$g(2) \stackrel{i=2}{=} 2$

$j=1 \quad x=0 \quad j=1$

$x=1 \quad j=2$

$x=2 \quad j=4$

$x=3 \quad j=7$

$\text{return } 7$

$g(3) \stackrel{i=3}{=} 3$

$j=1 \quad x=0 \quad j=1$

$x=1 \quad j=2$

$x=2 \quad j=4$

$x=3 \quad j=7$

$x=4 \quad j=11$

$\text{return } 11$

$g(4) \stackrel{i=4}{=} 4$

$j=1 \quad x=0 \quad j=1$

$x=1 \quad j=2$

$x=2 \quad j=4$

$x=3 \quad j=7$

$x=4 \quad j=11$

$\text{return } 11$

$g(5) \stackrel{i=5}{=} 5$

$j=1 \quad x=0 \quad j=1$

$x=1 \quad j=2$

$x=2 \quad j=4$

$x=3 \quad j=7$

$x=4 \quad j=11$

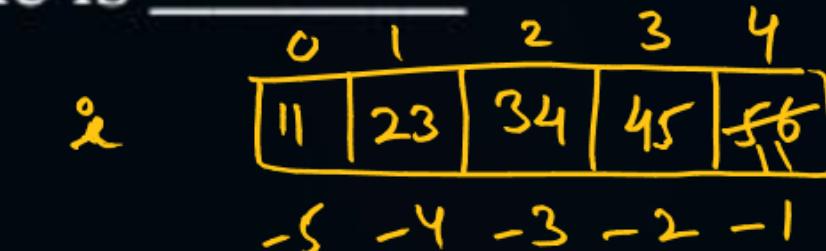
$x=5 \quad j=16$

$\text{return } 16$

#Q. The output printed by below code is \_\_\_\_\_

```
def f(i):
    if len(i)==0:
        return
    else:
        i[-1]=i[0]
        j=i[: - 2]
        print(j)
        f(j[3:])
```

```
a=[11, 23, 34, 45, 56]
f(a)
```



$i[-1] = 11$   
 $j = i[:-2] = j [11|23|34]$  Pointed  
 $f(\overset{o}{\text{empty list}})$   
 $\text{len}(i) == 0 \text{ return}$

A

[11,23]

C

[11,23,34,45]

B

[11,23,34]

D

[11,23,34,45,56]

```
#Q. def fun(n):
    x = 1
    if n == 1:
        return x
    for k in range(1, n):
        x += fun(k) * fun(n - k)
    return x
```

The return value of above code on  $\underline{f(3)}$  call is 5

$$\begin{aligned} & \text{fun}(3) \text{ n=3} \\ & x=1 \\ & k=1 \quad x=1 + \text{fun}(1) * \text{fun}(2) \Rightarrow x=1+1*2=3 \end{aligned}$$

$$k=2 \quad x=3 + \text{fun}(2) * \text{fun}(1) \Rightarrow x=3+2*1=\underline{5}$$

return 5

$$\begin{aligned} & \text{fun}(1) \text{ n=1} \\ & x=1 \quad \text{return } 1 \\ \hline & \text{fun}(2) \text{ n=2} \\ & x=1 \quad k>1 \quad x=1 + \text{fun}(1) * \text{fun}(1) \\ & \quad = 1 + 1 * 1 \\ & \quad = 2 \\ & \text{return } 2 \end{aligned}$$

**[MCQ]**

#Q. The output printed is \_\_\_\_\_

```
def foo(n: int, r: int):  
    if n > 0:  
        return (n % r) + foo(n // r, r)  
    else:  
        return 0  
print(foo(513, 2))
```

$$\begin{aligned} &\text{foo}(513, 2) \\ &= 1 + \text{foo}(256, 2) \\ &= 1 + 0 + \text{foo}(128, 2) \\ &= 1 + 0 + 0 + \text{foo}(64, 2) \\ &= 1 + 0 + 0 + 0 + \text{foo}(32, 2) \\ &= 1 + 0 + 0 + 0 + 0 + \text{foo}(16, 2) \\ &= 1 + 0 + 0 + 0 + 0 + 0 + \text{foo}(8, 2) \\ &= 1 + 0 + 0 + 0 + 0 + 0 + 0 + 1 + 0 \\ &= 2 \end{aligned}$$

A 0  
C ✓ 2

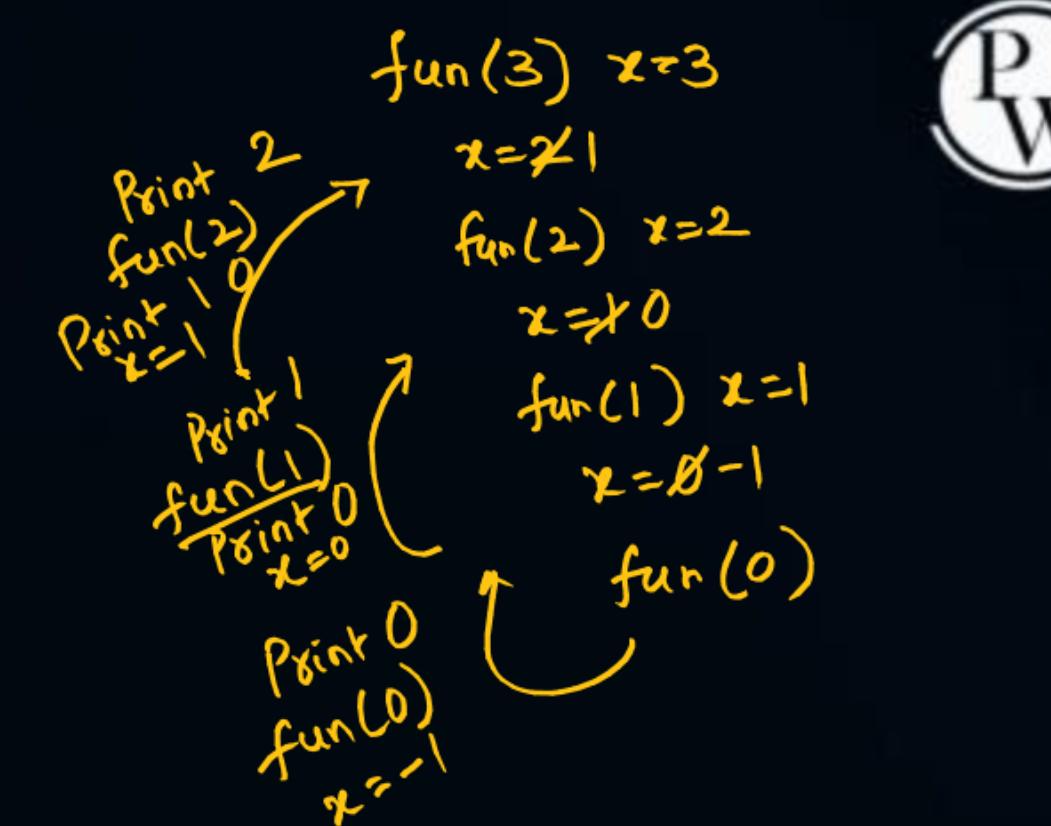
B 1  
D 9

# [MCQ]

#Q. The output of below python code segment is \_\_\_\_\_

```
def fun(x):
    if x > 0:
        x = x - 1
        fun(x) ✓
        print(x, end="")
    fun(x)
    x = x - 1
fun(3)
```

O/p: 0 1 0 2 0 1 0



fun(1) Print 0  
fun(2) Print 0 1 0

- A** ✓ 0102010
- C** 1010202

- B** 2012010
- D** 0101010



THANK - YOU