

Hand/desk execution

The purpose here is to ensure that you can reasonably quickly recognise/parse programming constructs and develop a sound understanding of the semantics of those constructs, and how they operate in conjunction with one another.

This is achieved by asking you to write down the output or the value of variables after executing a program fragment against provided input (where relevant).

1. Write down the output after executing the following program fragment.

```
var1=[20,30,22]
var2=var1
var1[2]=var1[2]+5
print (var2)
```

2. Write down the output after executing the following program fragment.

```
countries1=["Botswana", "Glasgow", "France"]
countries2=["Germany", "Spain"]
countries2=countries1
countries2.remove("Botswana")
print (countries1)
```

3. Write down the output after executing the following program fragment.

```
result = 0
def function( par1, par2):
    result=par1+par2
    print ("The sum of par1 and par2 is : ", result)

x=10
y=20
function( x, y )
print ("Result is equal to : ", result)
```

4. Write down what the following block of code will print out.

```
a = 0
for x in range( 4 ):
    a = a + ( x * 2 )
    if a < 10:
        a = a + 2
    else:
```

```
    a = a - 10
    print( a, end = " " )
print( "" )
```

5. Write down what the following block of code will print out.

```
a = 0
b = True
for x in [ 4, 2, 6, 3, 7, 4, 1 ]:
    if b:
        a = a + x
    else:
        a = a - x
    b = not b
    print( a, end = " " )
print( "" )
```

6. Write down what the following block of code will print out.

```
a = 100
b = [ 1, 6, 4, 8, 3, 4, 7, 9 ]
for i in range( len( b ) ):
    print( a, end = " " )
    a = a - b[ i ]
print( a )
```

7. Write down what the following block of code will print out.

```
a = 28
b = [ 3, 6, 10, 14, 19, 24, 29, 31, 38, 44 ]
c = 0
while b[ c ] < a:
    c = c + 1
print( c )
```

8. Write down what the following block of code will print out.

```
a = 0
for x in (1,5):
    a = a + (x * 2)
    if a < 20:
        a = a + a
print(a)
```

9. Write down what the following block of code will print out.

```
a = 100
b = [ 20, 1, 3, 5, 10, 4, 3, 7 ]
for i in range( len( b ) ):
    a = a - b[ i ]
print( a )
```

10. Write down what the following block of code will print out.

```
a = 42
b = [ 83, 80, 77, 15, 17 ]
c = 0
while b[ c ] > a:
    c = c + 1
print( c )
```

11. Write down the output after executing the following program fragments.

```
x = [ 1 ]
y = [ 2 ]
z = x * 3
x = y + x
print( z[ 1 ] )
```

12. Write down the value of `result` after executing the following code fragment.

```
result = 0
word = "skywalker"
x = "a"

for w in word:
    if w > x:
        result = result+1
```

13. Write down the value of `result` after executing the following code fragment.

```
c = 0
result = 0
for c in range (5):
    if c%2 == 0:
        result = result + 1
        result = result + c
```

14. Write down the value of `result` after executing the following code fragment.

```
c = 0
result = 0
for c in range (5):
```

```
if c%2 == 0:
    result = result + 1
result = result + c
```

15. Write down the value of `result` after executing the following code fragment.

```
c = 0
result = 0
for c in range (5):
    if c%2 == 0:
        result = result + 1
result = result + c
```

16. Write down the value of `result` after executing the following code fragment.

```
result = 0
while result < 9:
    if result%2 == 0:
        result = result + 1
    else:
        result = result + result
```

17. Write down the value of `result` after executing the following code fragment.

```
a = "uotlgch"
b = "r"
c = "xiqittosau"
d = "i"
e = "ptuuepnttt"

def foo(s):
    if len(s) > 1:
        s = s[len(s)-2]
    return s

result = ""
for x in [a,b,c,d,e]:
    result = result + foo(x)
```

18. Write down the output from the following fragments of code.

```
def foo(n):
    if n <= 1:
        return n
    else:
        return n + foo(n-1)
```

```
c = 7
print(foo(c))
```

19. Write down the value of `result` after executing the following code fragment.

Note: The `pop()` function returns the element at the specified position and removes it from the list. If no index is specified, `pop()` removes and returns the last item in the list.

```
result = 0
ages = {'Yoda':900, 'Luke':19, 'Leia':19, 'Chewie':204,
        'Han':32}
ages.pop('Luke')
ages.pop('Chewie')
ages.pop('Han')
for x in ages:
    result += (ages[x])
```

20. Write down the value of `result` after executing the following code fragment.

Note: The `find(substring)` function returns the index of the first occurrence of `substring` if it is found in given string. If it is not found then it returns -1.

```
a = "dagobah"
b = "endor"
c = "tatooine"
d = "crait"
e = "dantooine"

result = 0
result = result + a.find("g")
result = result + len(b)
result = result * c.find("too")
result = result + d.find("x")
result = result + len(e.split("t")[0])
```

21. Write down the value of `result` after executing the following code fragment.

```
# Assume a file called data.txt contains the following lines
# of text:
# The Empire Strikes Back
# The Last Jedi
# Return of the Jedi

f = open( "data.txt" )
lines = f.readlines()
```

```
words = []
result = ""
for line in lines:
    for word in line.split():
        words.append(word)
words.reverse()
new_words = [6, 3, 2, 1, 9]
for w in new_words:
    result = result + words[w] + " "
```

22. Write down what the following block of code will print out.

Note: The `find(substring)` function returns the index of the first occurrence of *substring* if it is found in given string. If it is not found then it returns -1.

```
a = "3214"
b = [0, 3, 2, 1]
c = 0
d = 0
for i in range(len(b)):
    c = int(b[i])
    d += c + a.find(str(c))
print(d)
```

23. Write down what the following block of code will print out.

Note: The `find(substring)` function returns the index of the first occurrence of *substring* if it is found in given string. If it is not found then it returns -1.

```
words = "hoth dagobah tatooine"
result = 0
for c in ("abcdefghi"):
    result += words.find(c)
print (result)
```

24. Write down what the following block of code will print out.

```
b = [ 3, 6, 10, 7, 19, 24, 20, 31, 38, 44 ]
u = b[ 0 ] < b[ 1 ]
p = b[ 1 ]
for i in range( 2, len( b ) ):
    if u and p > b[ i ]:
        print( "x" + str( i-1 ), end = " " )
        u = not u
    elif not u and p < b[ i ]:
        print( "y" + str( i-1 ), end = " " )
```

```
u = not u
p = b[ i ]
```

25. Write down what the following block of code will print out.

```
# Assume a file data.txt contains the following lines of text
# 1,3,6,2
# 2,4,6,8
# 3,9,1,2

f = open( "data.txt" )
lines = f.readlines()
cs = len( lines[ 0 ].split(",") )
d = [0] * cs
for line in lines:
    ns = line[ :-1 ] # the [ :-1 ] removes the new line
                    # symbol
                    # from the end of the line read from
file
    ns = ns.split( "," )
    for n in range( cs ):
        d[ n ] = d[ n ] + int( ns[ n ] )
for n in range( cs ):
    print( d[ n ], end=" " )
```