

INSTITUTO SUPERIOR DE ECONOMIA E GESTÃO

Name: _____ Number: _____

Part I (40 points)
Select the correct option for each question.

1. What is the output of the following lines of code:

```
x=1
if(x!=1):
    print('Hello')
else:
    print('Hi')
    print('Mike')
```

<input type="checkbox"/>	Hello Mike
<input type="checkbox"/>	Mike
<input type="checkbox"/>	The Mike
<input type="checkbox"/>	Hi Mike

2. What is the output of the following few lines of code ?

```
A=['1','2','3']
for a in A:
    print(2*a)
```

<input type="checkbox"/>	'2' '4' '6'
<input type="checkbox"/>	2 4 6
<input type="checkbox"/>	'11' '22' '33'
<input type="checkbox"/>	A B C

3. Consider the function Delta, when will the function return a value of 1?

```
def Delta(x): if x==0: y=1; else: y=0; return(y)
```

<input type="checkbox"/>	When the input is 0
<input type="checkbox"/>	Never
<input type="checkbox"/>	When the input in 1
<input type="checkbox"/>	When the input is anything but 0

4. What is the correct way to sort the list 'B' using a method, the result should not return a new list, just change the list 'B'.

<input type="checkbox"/>	B.sorted()
<input type="checkbox"/>	sorted(B)
<input type="checkbox"/>	sort(B)
<input type="checkbox"/>	B.sort()

5. What are the keys of the of the following {'a':1,'b':2}

<input type="checkbox"/>	:::
<input type="checkbox"/>	1,2
<input type="checkbox"/>	a,b

6. what is the result of the following lines of code:

```
a=np.array([0,1,0,1,0])
b=np.array([1,0,1,0,1])
a*b
```

<input type="checkbox"/>	array([1, 1, 1, 1, 1])
<input type="checkbox"/>	array([0, 0, 0, 0, 0])
<input type="checkbox"/>	0

INSTITUTO SUPERIOR DE ECONOMIA E GESTÃO

7. what is the result of the following lines of code:

```
a=np.array([0,1])
b=np.array([1,0])
np.dot(a,b)
```

array([1,1])
0
1
array([0,0])

8. what is the result of the following lines of code:

```
a=np.array([1,1,1,1,1])
a+10
```

array([10,10,10,10,10])
array([11, 11, 11, 11, 11])
array([1,1,1,1,1])

9. what is the correct code to perform matrix multiplication on the matrix A and B

A x B
A * B
np. dot (A,B)

10. What is the syntax to obtain the first element of the tuple:

A[1]
A=('a','b','c')
A[0]
A[:]

11. How many duplicate elements can you have in a set?

1
100
0, you can only have one unique element in a set
depends on the number of elements in your set.

12. Consider the following Python Dictionary: Dict={"A":1,"B":2,"C":[3,3,3],"D":(4,4,4),'E':5,'F':6} , what is the result of the following operation: Dict["D"]

3
(4, 4, 4)
error
4
[3,3,3]

13. What is an important difference between lists and tuples?

Lists are mutable tuples are not
There is no zeros in lists
Lists can't contain a string
Tuples can only have integers
Lists and tuples are the same.

14. When you encounter an error in Python, what should you do?

Search the course discussion forum and post a question if yours hasn't been asked.
Read the error message.
Try help() or dir() .
Use Google or StackOverflow to find an answer.
All of the above.

INSTITUTO SUPERIOR DE ECONOMIA E GESTÃO

```
15. def modify(mylist):
    mylist[0] *= 10
    return(mylist)
L = [1, 3, 5, 7, 9]
M = modify(L)
M is L
```

What is the value of the final line?

<input type="checkbox"/>	False
<input type="checkbox"/>	This code contains an error.
<input type="checkbox"/>	True

16. Consider the following code:

```
L1 = [2,3,4]
L2 = L1
L2[0] = 24
```

What does L1 equal?

<input type="checkbox"/>	[24, 3, 4]
<input type="checkbox"/>	[2,3,4]
<input type="checkbox"/>	This code contains an error.

17.

```
G = nx.Graph()
G.add_nodes_from(1,2,3,4)
G.add_edges_from((1,2),(3,4))
G.number_of_nodes(), G.number_of_edges()
```

What does this return?

<input type="checkbox"/>	4, 4
<input type="checkbox"/>	4, 0
<input type="checkbox"/>	1, 0
<input type="checkbox"/>	4, 2
<input type="checkbox"/>	This code contains an error.

18. Which function in networkx (imported as nx) plots a network?

<input type="checkbox"/>	nx.graph
<input type="checkbox"/>	nx.plot
<input type="checkbox"/>	nx.Graph
<input type="checkbox"/>	nx.draw

19. For a given network G, what does len(G) return?

<input type="checkbox"/>	The number of nodes
<input type="checkbox"/>	The length of the longest path
<input type="checkbox"/>	The size of the largest component
<input type="checkbox"/>	The number of edges
<input type="checkbox"/>	A list of nodes in each component

20. What does plt.plot([0,1,2],[0,1,4],"rd-") do?

<input type="checkbox"/>	This code contains an error.
<input type="checkbox"/>	A plot of two connected lines, and red dots at the junctures.
<input type="checkbox"/>	A plot of two connected lines, with red diamonds at the junctures.
<input type="checkbox"/>	A plot of a smooth curve, and red dots at the endpoints.

Part II (60 points)

1. Write a Python program to multiply two user-entered integers without using the * operator in python.

2. Write a python program to find the next smaller palindrome of a specified number.

A palindrome number is a number that remains the same when its digits are reversed. Like 15951, for example, is "symmetrical".

Ex:

```
print (Next_mall_Palindrome (99))  
101  
print (Next_mall_Palindrome (1221))  
1331
```

3. Implement the algorithm described below.

The bubble sort algorithm is as follows:

Consider a named list of A

Compare A [0] and A [1], if A [0] is greater than A [1], change the elements. Move to the next element, A [1] (which can now contain the result of a step change. previous), and compare with A [2].

If A [1] is greater than A [2], replace the elements. Do this for each pair of elements until the end of the list.

Follow steps 1 and 2 n times.

4. Implement a program to multiply two arrays using loops

(Matrix multiplication reference:

If A = [a i j] is an m × n matrix and B = [b i j] is an n × p matrix, then product AB is an m × p matrix.

AB = [c i j], where c i j = a i 1 b 1 j + a i 2 b 2 j + ... + a i n b n j.)