Midterm 2

Q1. What is the output of the following function?

```python
def func1():
    A = [4*[2] for i in range(3)]
    B = [3*[4] for i in range(4)]
    C = [3*[0] for i in range(3)]
    for i in range(3):
        for j in range(3):
            for k in range(4):
                C[i][j] = C[i][j] + (A[i][k] * B[k][j])
    print C

(A) [[16, 16, 16], [16, 16, 16], [16, 16, 16]]
(B) *[[32, 32, 32], [32, 32, 32], [32, 32, 32]]
(C) [[8, 8, 8], [8, 8, 8], [8, 8, 8]]
(D) [[24, 24, 24], [24, 24, 24], [24, 24, 24]]
```

Q2. What is the output of the following function?

```python
def func2():
    m = [[1, 1, 1, 1], [1, 1, 1, 1], [1, 1, 1, 1], [1, 1, 1, 1]]
    a = len(m)
    b = len(m[0])
    for j in range(b):
        m[j][0] = 3
    for k in range(a):
        m[k][k] = 6
    print m

(A) *[[6, 1, 1, 1], [3, 6, 0, 1], [0, 6, 3, 1], [1, 6, 3, 0]]
(B) [[0, 1, 1, 6], [6, 0, 1, 3], [1, 0, 6, 1], [1, 1, 6, 3]]
(C) [[3, 3, 3, 1], [1, 3, 3, 1], [1, 1, 3, 3], [1, 3, 1, 3]]
(D) [[6, 1, 1, 1], [3, 6, 1, 1], [3, 6, 1, 1], [3, 1, 1, 6]]
```

Q3. Suppose we have a large data matrix m, populated with values in the range 0-255. What is the output of the following function?

```python
def func4(m):
    rows = len(m)
    columns = len(m[0])
    canvas = makeEmptyPicture(columns, rows, black)
    show(canvas)
    for row in range(rows):
        for col in range(columns):
            color = makeColor(m[row][col], m[row][col], m[row][col])
            setColor(getPixel(canvas, col, row), color)
    repaint(canvas)

(A) *A gray scale picture.
(B) A red scale picture.
```
Q4. You are given the following code which prints the matrix m row by row:

```python
def fun(m):
    a = len(m)
    b = len(m[0])
    for i in range(b):
        for j in range(a):
            print m[j][i]

m = [[1, 2, 3], [4, 5, 6]]
fun(m)
```

Which of the following functions prints the matrix column by column?

(i)  
```python
def fun(m):
    a = len(m)
    b = len(m[0])
    for j in range(a):
        for i in range(b):
            print m[j][i]
```

(ii)  
```python
def fun(m):
    a = len(m)
    b = len(m[0])
    for j in range(a):
        for i in range(b):
            print m[i][j]
```

(iii)  
```python
def fun(m):
    a = len(m)
    b = len(m[0])
    for i in range(b):
        for j in range(a):
            print m[i][j]
```

(A) *i*
(B) ii)
(C) iii)
(D) i) and iii)

Q5. Consider the following tree:

```python
tree = [["a", "b", ["a", "b"]], ["a", "b"], ["a", "b", "a"]]
```

Which of the following expressions resolves to “b”?

(i)  
```python
tree[0][2][1]
```

(ii)  
```python
tree[2][0][1]
```
Q6. Which list describes the following tree?

(A) `[["a","b","c"], ["d","e","f"]]
(B) `[["a","b","c"], [ ["d","e"], ["f"] ]]
(C) `[["a","b","c"], [ ["d","e"], ["f"] ]]
(D) None of the above

Q7. Which of the following trees has the value 'a' at index [1][1]?

i)

ii)

iii)

iv)

(A) i)
(B) * iv)
(C) ii)
(D) iii)

Q8. Suppose you have the following list:

L = [('Jack', 123), ('Jane', 456), ('John', 789)]

Which of the following statements will create a dictionary from the above list?

(A) `myDict = dict((L))
(B) `myDict = dict([L])
(C) `myDict = dict(L, 3)
(D) * myDict = dict(L)

Q9. Suppose you have the following dictionary:

myDict = {'A':'Adam', 'Bryan': 'B', 'D': 'Dave', 'C': 'Carl', 'B': 'Bryan'}

Which of the following statements will output 'Bryan'

(A) `myDict['Bryan']
(B) *myDict['B']
(C) `myDict('B')
(D) `myDict('Bryan')

Q10. Consider the list people and the dictionary dict below:

people = [{'lname':'Lincoln', 'fname':'Abraham', 'bdate':'1809-2-12'},
dict([('fname','George'), ('iname','Washington'), ('bdate','1732-2-22')])]

How would you print the following phrase?

My name is George Washington and I was born 1732-2-22
Q11. Consider the following code example and then choose the answer that best describes the purpose of the function:

```python
def t4(c):
    x = {}
    for i in range(128):
        x[chr(i)] = i
    return x[c]
```

A) It returns the upper case version of the letter provided as input parameter
B) It creates and returns a filled ASCII table dictionary
C) * It performs the same function as the built in ord() function
D) It returns the character that corresponds to the input parameter

Q12. Which of the following code snippets will print both keys and values of the dictionary:

```python
myDict = {"a":1, "b":2, "c":3}
```

i)

```python
for k in myDict:
    print k
```

ii)

```python
for k,v in myDict.items():
    print k, v
```

iii)

```python
for k in myDict:
    print k, dict[k]
```

(A) i)
(B) * ii) and iii)
(C) iii)
(D) i) and iii)

Q13. Consider the following code snippet:

```python
a = "one"
b = "two"
c = "three"
x = (0, 0, 1, a, 2, b, 3, c, 4, "four", 5, "five")
```

Which of the following statements print the string “two”?

(A) * print x[5]
(B) print x[2]
(C) print x[4]
(D) print x[3]

Q14. Consider the following code snippet:

```python
x = [('S1', 'Kate'), ('S2', 'Brittany'), ('S3', 'Alice')]
```

After having executed this statement, the variable x is a:

(A) List of lists
(B) Dictionary
(C) Tuple of tuples
(D) * List of tuple
Q15. You are given the following code:

\[
\begin{align*}
T &= (0, 1, 2, 3) \\
S &= "0123" \\
L &= [0, 1, 2, 3] \\
D &= \{0:"lion", 1:"witch", 2:"wardrobe"\}
\end{align*}
\]

Which of the following statements will generate an error?

(i) 
\(T[1] = 4\)

(ii) 
\(L[3] = 5\)

(iii) 
\(D["and"] = 3\)

(iv) 
\(S[2] = 'a'\)

(A) iii  
(B) iii) and iv)  
(C) i), iii), and iv)  
(D) * i) and iv)

Q16. Suppose you have the following function:

\[
\text{def fun(string):} \\
\text{\quad result = "\"} \\
\text{\quad size = len(string)} \\
\text{\quad for i in range(0,size,2):} \\
\text{\quad \quad result = result + string[i]} \\
\text{\quad return result}
\]

Which is the output of:

\[
\text{print fun("Philadelphia")}
\]

(A) 'Philadelphia'  
(B) 'Philad'  
(C) * 'Piaepi'  
(D) 'elphia'

Q17. Suppose you have the following string:

\[
\text{str = "cookie"}
\]

What is the output of:

\[
\text{str[ str.find('o') +1 : len(str)]}
\]

(A) * 'okie'  
(B) 'okie'  
(C) 'cookie'  
(D) 'cook'

Q18. What is the output of the following code snippet:

\[
\text{>>> colors = "violet-purple-blue"}
\]

---

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\(S[2] = 'a'\)

(A) iii  
(B) iii) and iv)  
(C) i), iii), and iv)  
(D) * i) and iv)

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(A) * 'okie'  
(B) 'okie'  
(C) 'cookie'  
(D) 'cook'

Q18. What is the output of the following code snippet:

\[
\text{>>> colors = "violet-purple-blue"}
\]
>>> L = colors.split('l')
>>> print L
(A) ['violet', 'purple', 'blue']
(B) * ['vio', 'et-purp', 'e-b', 'ue']
(C) ['viol', 'et-purpl', 'e-bl', 'ue']
(D) ['vioet', 'purpe', 'bue']

Q19. Suppose you have the following function:

def myFun(string):
    size = len(string)
    result = ""
    for i in range(size/2):
        result = result + string[size - i -1 ]
    return result

What is the output of:

print myFun("football")

(A) ball
(B) foot
(C) * llab
(D) toof

Q20. Suppose you have a html file named “test” containing the following lines:

<html>
<head>
<title>The Simplest Possible Web Page</title>
</head>
<body>
<h1>A Simple Heading</h1>
<p>This is a paragraph in the simplest possible Web page.</p>
</body>
</html>

What is the output of the following function:

def my_func():
    file = open("test","rt")
    contents = file.read()
    print contents[7:12]
    file.close()

(A) * <head
(B) head>
(C) \n<hea
(D) An empty line followed by a line with <head

Q21. What is the result of the execution of the function below:

def my_func():
    file = open(pickAFile(),"wt")
    contents = file.readlines()
    file.close()
    print contents

(A) Read the whole file into a list where each element is a single line, and print that list.
(B) Read the whole file as a string and print that string
(C) * IOError: File not open for reading
(D) An error, since the file could not be closed before printing its content

Q22. Suppose you have a text file named “test” containing the following two lines:

ABC
XYZ

What will the following program print?

```python
def my_func():
    file = open("test","rt")
    contents = file.readlines()
    file.close()
    file = open("test","rt")
    contents[0] = file.read()
    file.close()
    print contents
```

(A) ['ABC','XYZ']
(B) ['ABC']
(C) *['ABC\n XYZ','XYZ']
(D) [['ABC','XYZ'], 'XYZ']

Q23. Consider the following list:

```python
list = [['A', 'B'], ['C', 'D'], ['E', 'F'], ['G', 'H']]```

Which of the following randomly selects a single character out of the list?

(i) 
```python
print random.choice(list[int(random.random() * 4)])
```

(ii) 
```python
print random.choice(list)
```

(iii) 
```python
print random.choice(list[int(random.random() * 2)])
```

(iv) 
```python
print list[int(random.random() * 4)]
```

(A) ii) and iv)
(B) * i) and iii)
(C) i) and iv)
(D) None of the above

Q24. Which of the following Python objects are immutable?

(i) Tuples
(ii) List
(iii) Strings
(iv) Dictionaries

(A) i)
(B) * i) and iii)
(C) iii) and iv)
(D) ii) and iii)

Q25. Which of the following statements is the correct one to open a JPEG file myfile for reading its content?

(A) * open(myfile, "rb")
(B) open(myfile, "rt")
(C) open(myfile, "wt")
(D) open(myfile, "wb")