**CONDITIONAL**

```python
x, y, = 2, 16

if (true and false) or true:
    if x < y:
        x = x * x
    else:
        y = x + y

if (false or true) and false:
    if x <= y:
        x = 1
    else:
        y = y + y

else:
    x = x * x

if x <= y:
    y = x + y

print 'x = ', x
print 'y = ', y
```

What is the output of this code fragment?

a) x = 4
   y = 22
b) x = 3
   y = 19
c) x = 4
   y = 20
d) x = 4
   y = 23
e) x = 16
   y = 32
Class Node:
    def __init__(self, data):
        self._data = data
        self._right = None  # right child node
        self._left = None   # left child node

    ...
    ...

def Traverse(self, root):
    if root is not None:
        print root._data
        if root._left is not None:
            Traverse(root._left)
        if root._right is not None:
            Traverse(root._right)

What is the output of this Traversal method on the above BST, where 8 is passed as the root?

a) 3  b) 2  c) 8  d) 8  e) 8
    5  3  6  6  12
   4  4  12  2  15
  2  5  2  4  13
  6  6  15  3  6
 13  8  4  5  2
15 12 13 12  4
12 13  3 15  5
 8 15  5 13  3
array1 = [ 4, 5, 3, 6, 2, 7, 1 ]
array2 = [ 7, 4, 2, 1 ]

if array1[ 1 ] > array2[1]:

What is the value of array1 after this code is executed?

a) [ 4, 4, 2, 7, 2, 2, 1 ]
b) [ 4, 7, 3, 6, 7, 7, 7 ]
c) [ 4, 7, 2, 7, 6, 7, 7 ]
d) [ 4, 7, 2, 7, 2, 2, 1 ]
e) [ 4, 7, 2, 6, 6, 7, 6 ]
HASH TABLES

Which is the resulting Hash Table that is made when the following < key , data> pairs are added? The hash code form of the key is given in the parenthesis after the pair. The HashTable is of size 5 and uses external chaining.

< “Fluffy”, “Cat” > ( 54 )
< “Fido”, “Dog” > ( 33 )
< “Mr. Bubbles”, “Fish” > ( 79 )
< “Bugs”, “Rabbit” > ( 12 )
< “Robbie”, “Robot” > ( 10 )
< “Puff”, “Dragon” > ( 25 )
< “Tux”, “Penguin” > ( 31 )

a)
Fluffy
Fido
Mr. Bubbles
Bugs
Robbie

d)
Robot -> Cat
Rabbit -> Fish
Dragon
Dog
Penguin

e)
Fish -> Cat
Dog
Rabbit
Penguin
Dragon -> Robot

c)
Robbie -> Puff
Tux
Bugs
Fido
Fluffy -> Mr.Bubbles

b)
Robot -> Dragon
Penguin
Rabbit
Dog
Cat -> Fish
SORTING

The following method “isSorted” should return true if the array “x” is sorted in ascending order. Otherwise, method should return false:

def isSorted( x )

    #missing code

Which of the following code fragments is the missing code?

a) b = true
   for i in range( 0, len(x) ):
       if x[ i ] > x[ i + 1 ]:
           b = false
       else:
           b = true
   return b

b) for i in range( 0, len(x) ):
    
        if x[ i ] > x[ i + 1 ]:
            return false
    return true

c) b = false
   for i in range( 0, len(x) ):

        if x[ i ] > x[ i + 1 ]:
            b = false
   return b

d) b = false
for i in range( 0, len(x) ):

        if x[ i ] > x[ i + 1 ]:
            b = true
return b

e) for i in range( 0, len(x) ):

        if x[ i ] > x[ i + 1 ]:
            return true
return false
Class Trace:
    def __init__(self, n):
        self.myNumber = n

    def getMyNumber(self):
        return self.myNumber

    def setMyNumber(self, n):
        self.myNumber = n

    def __str__(self):
        return "My number is ", self.myNumber

a = Trace(5)
b = Trace(6)
c = Trace(-3)

myArray = []
myArray.append(b)
myArray.append(c)
myArray.append(a)

for int i in myArray:
    print i

b.setMyNumber(c.getMyNumber())
a.setMyNumber(c.getMyNumber())

print b
println myArray[2]
What is the output of the Trace class on the preceding page?

a) 5
   6
   -3
   -3
   -3

b) 5
   6
   -3
   My number is -3
   My number is 5

   5
   My number is 6
   My number is 5

d) 6
   -3
   5
   My number is -3
   My number is 5

   5

(e) My number is 6
    My number is -3
    My number is 5
    -3
    5
LOOPS

x = [ 2, 1, 4, 5, 7 ]
limit, i, sum = 7, 0, 0

while sum < limit and i < len(x):
    sum = sum + x[i]
    i = i + 1

What is the value of the variable “i” after the code is executed?

a) 0  
b) 2  
c) 3  
d) 4  
e) 7
def Eval(s, c, value)
    if len(s) == 0:
        return value
    elif s[0] == c:
        value = value * 2
        return Eval(s[1:], c, value)
    else:
        value += 1;
        return Eval(s[1:], c, value)

What is the value returned by this method call?
Eval("mississippi", 'i', 1);

a) 60
b) 213
c) 44
d) 12
e) 30
POLYMORPHISM

Given the following class hierarchy:

given the following class hierarchy:

public abstract class Emotion
    has: public void express()

public interface Crying
    has: public void tears()

public class Joy extends Emotion implements Crying
    has: public void smile()
    has: public void tears()

public class PureJoy extends Joy
    has: public void exult()

public class Anger extends Emotion
    has: public void yell()

Determine whether the following statements will compile and run without errors.
If no errors write OK.
If compile error write COMP
If run time error write RUN

1) Emotion e = new Emotion();
2) Emotion my = new Joy();
3) Emotion great = new PureJoy();
    great.tears();
4) Emotion well = new Joy();
    ((Anger)well.yell());
5) PureJoy lastone = new Joy();

<table>
<thead>
<tr>
<th>a) OK</th>
<th>b) COMP</th>
<th>c) COMP</th>
<th>d) OK</th>
<th>e) COMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
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</tr>
</tbody>
</table>
array = [ 0, 1, 2, 3, 5, 9 , 4, 8 ]
i = 0

while i < ( len( array ) - 1 ) and array[ i + 1 ] > array[ i ]:
    i = i + 1;

print i

What is the output of the code above?

a) 6
b) 5
c) 7
d) 4
e) 9
DYNAMIC BINDING
Class Temp:
    def printer(self):
        print "Printer method in Temp class"

Class myTemp (Temp):
    def printer(self):
        print "Printer method in myTemp class"

Class aTemp (myTemp):
    def printer(self):
        print "Printer method in aTemp class"

    t = Temp
    t.printer()
    at = aTemp

    t = at
    t.printer()

    mt = myTemp
    mt.printer

    mt = t
    mt.printer

What is the output of the preceding code?
a) Printer method in Temp class
   Printer method in Temp class
   Printer method in myTemp class
   Printer method in myTemp class

b) Printer method in Temp class
   Printer method in aTemp class
   Printer method in Temp class
   Printer method in aTemp class

c) Printer method in aTemp class
   Printer method in Temp class
   Printer method in Temp class
   Printer method in aTemp class

d) Printer method in aTemp class
   Printer method in aTemp class
   Printer method in myTemp class
   Printer method in myTemp class

e) Printer method in Temp class
   Printer method in aTemp class
   Printer method in myTemp class
   Printer method in aTemp class


public class myFrame extends Frame
{
    public static void main(String argv[])
    {
        myFrame f = new myFrame();
        f.setSize(300,200);
        f.setVisible(true);
    }
}

How would you set the frame surface color to red

a) f.setBackground(Color.red);
b) f.setColor(RED);
c) f.Background(red);
d) f.color=Color.red;
e) f.setColor(Color.red);
LINKED LIST

Class ListNode:
    def __init__(self):
        __next = None
        __data = None
    ...

Assume that position is an object of class ListNode. Assume that head is the beginning of the linked list.

Which of the following class changes position so that it is referencing the next item in the linked list and deletes the node at the beginning of the linked list?

a) position.__next = head.__next;
    head.__next = head;

b) position.__next = head.__next;
    head = position.__next;

c) position = head.__next;
    head = position;

d) position = head.__next;
    head = position.__next;

e) position = head;
    head = position.__next;