int x = 2;
int y = 16;

if ((true && false) || true
{
    if (x < y)
        x = x * x;
    else
        y = x + y;
}
if ((false || true) && false)
{
    if (x <= y)
        x++;
    else
        y = y + y;
}
else
    x = x * x;

if (x <= y)
    y = x + y;

System.out.println("x = " + x);
System.out.println("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
BST

Public class Node
{
    private Node left; // left child node
    private Node right; // right child node
    private int data;

    public Node getLeft() {
        return left;
    }
    public Node getRight() {
        return right;
    }
    public int getData() {
        return data;
    }
    ...
}

public void Traverse(Node root) {
    if (root.getData() != null)
        System.out.println(root.getData());
    if (root.getLeft() != null)
        Traverse(root.getLeft());
    if (root.getRight() != null)
        Traverse(root.getRight());
}

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          6 12         2 15         13 4
    4 4 12 13 12 15 13 15 5
    2 5 2 4 5 4 3 6
    6 6 15 15 3 6
    13 8 4 5
    15 12 13 3 15
    8 15 5 13 3

int array1 = { 4, 5, 3, 6, 2, 7, 1 };  
int array2 = { 7, 4, 2, 1 };  

array1[ 3 ] = array1[ 5 ];  
array1[ 2 ] = array2[ 2 ];  
array1[ 6 ] = array1[3];  
array1[ 1 ] += 2;  

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) | b) | d) | e) |
--- | --- | --- | --- |
Fluffy | Robot -> | Cat |
Fido | Rabbit -> | Fish |
Mr.Bubbles | Dragon |
Bugs | Dog |
Robbie | Penguin |

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Robot -&gt;</td>
<td>Dragon</td>
</tr>
<tr>
<td>Penguin</td>
<td></td>
</tr>
<tr>
<td>Rabbit</td>
<td></td>
</tr>
<tr>
<td>Dog</td>
<td></td>
</tr>
<tr>
<td>Cat -&gt;</td>
<td>Fish</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish -&gt;</td>
<td>Cat</td>
</tr>
<tr>
<td>Dog</td>
<td></td>
</tr>
<tr>
<td>Rabbit</td>
<td></td>
</tr>
<tr>
<td>Penguin</td>
<td></td>
</tr>
<tr>
<td>Dragon -&gt;</td>
<td>Robot</td>
</tr>
</tbody>
</table>
SORTING

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

public static Boolean isSorted( int[] x )
{
    //missing code
}

Which of the following code fragments is the missing code?

a) boolean b = true;
   for ( int i = 0; i < x.length - 1; i++ )
   {
       if ( x[ i ] > x[ i + 1 ] )
           b = false;
       else
           b = true;
   }
   return b;

b) for (int i = 0; i < x.length - 1; i++ )
   {
       if ( x[ i ] > x[ i + 1 ] )
           return false;
   }
   return true;

c) boolean b = false;
   for ( int i = 0; i < x.length - 1; i++ )
   {
       if ( x[ i ] > x[ i + 1 ] )
           b = false;
   }
   return b;

d) boolean b = false;
   for ( int i = 0; i < x.length - 1; i++ )
   {
       if ( x[ i ] > x[ i + 1 ] )
           b = true;
   }
   return b;

e) for ( int i = 0; i < x.length - 1; i++ )
   {
       if ( x[ i ] > x[ i + 1 ] )
           return true;
   }
   return false;
public class Trace {
    private int myNumber;

    public Trace ( int n )
    {
        setMyNumber( n );
    }
    public int getMyNumber()
    {
        return myNumber;
    }
    public void setMyNumber( int n )
    {
        this.myNumber = n;
    }
    public String toString()
    {
        return "My number is " + getMyNumber();
    }
    public static void main(String[] args)
    {
        Trace a = new Trace( 5 );
        Trace b = new Trace( 6 );
        Trace c = new Trace(-3 );

        Trace[] myArray = new Trace[3];
        myArray[0] = b;
        myArray[1] = c;
        myArray[2] = a;

        for( int i = 0; i < myArray.length ;i++ )
        {
            System.out.println( myArray[i].getMyNumber() );
        }
        b.setMyNumber( c.getMyNumber() );
        a.setMyNumber( c.getMyNumber() );

        System.out.println( b );
        System.out.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

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

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

e) My number is 6
   My number is -3
   My number is 5
   -3
   5
int[] x = { 2, 1, 4, 5, 7 };  
int limit = 7;  
int i = 0;  
int sum = 0;  

while ( ( sum < limit ) && ( i < x.length ) )  
{  
    sum += x[ i ];  
    i++;  
}

What is the value of the variable "i" after the code is executed?

a) 0  
b) 2  
c) 3  
d) 4  
e) 7
public int Eval(String s, char c, value)
{
    if (s.length == 0)
        return value;
    else if (s.charAt(0).equals(c))
    {
        value = value * 2;
        return Eval(s.substring(1), c, value);
    }
    else
    {
        value++;
        return Eval(s.substring(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:

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();

a) OK   b) COMP   c) COMP   d) OK   e) COMP
OK   OK    OK    OK    COMP
RUN  OK    RUN   RUN   OK
OK   RUN   OK    COMP  OK
OK   COMP  OK    OK    COMP
int array[] = { 0, 1, 2, 3, 5, 9, 4, 8};
int i = 0;

while( ( i < array.length - 1 ) && ( array[ i + 1 ] > array[ i ] ) )
{
    i++;
}
System.out.println( i );

What is the output of the code above?

a) 6  
b) 5  
c) 7  
d) 4  
e) 9
DYNAMIC BINDING

public class Temp
{
    public static void printer()
    {
        System.out.println("Printer method in Temp class");
    }
}

public class myTemp extends Temp
{
    public static void printer()
    {
        System.out.println("Printer method in myTemp class");
    }
}

public class aTemp extends myTemp
{
    public static void printer()
    {
        System.out.println("Printer method in aTemp class");
    }
    public static void main( String[] args )
    {
        Temp t = new Temp();
        t.printer();
        aTemp at = new aTemp();

        t = at;
        t.printer();

        myTemp mt = new 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**

```java
public class ListNode {
    private ListNode next;
    private String data;
    ...
}
```

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;