| Signature | Name |
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| cs11f | Student ID |

CSE 11 Midterm Fall 2010

| Page 1 | _ (16 points) |
|--------|---|
| Page 2 | _ (14 points) |
| Page 3 | _ (30 points) |
| Page 4 | _ (16 points) |
| Page 5 | _ (10 points) |
| Total | (86 points = 82 base points + 4 points EC [5%] |

(Partial) Operator Precedence Table

| Operators | | Associativity | | |
|-----------|----|---------------|-----------------|---------------|
| ! | ++ | (pre | & post inc/dec) | right to left |
| * | / | % | | left to right |
| + | - | | | left to right |
| < | <= | > | >= | left to right |
| == | != | | | left to right |
| && | | | | left to right |
| | | | | left to right |
| = | | | | right to left |

1) What are the values of the indicated variables after the following code segments are executed?

```
int x = 3, y = 5;
boolean z = !((x > 4) || (y <= 6)) == ((y <= 4) && (x > 6));

if ( x++ >= 4 || --y >= 3 )
    x = x++ + --y;
else
    x = ++x + y--;
```

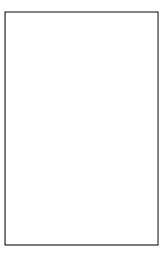
```
x = y = z =
```

```
int a = 3, b = 5;
boolean c = !(b > 4) && (a <= 6) && (a <= 4) || (b > 6);

if ( a++ >= 4 && --b >= 3 )
   a = a++ + --b;
else
   a = ++a + b--;
```

```
a = b = c =
```

What gets printed?



2) Given the following definition of class Thing2, what is the output of the Java application Question2?

```
class Thing2
 private int count;
 public Thing2( int count )
   this.count = count;
 public int getCount()
   return this.count;
 public void setCount( int count )
   this.count = count;
 public String toString()
   if ( this.count == 5 )
     return "five";
   else if ( this.count == 6 )
     return "six";
   else if ( this.count == 7 )
     return "seven";
   else
     return "need more";
 public void swap1( Thing2 t2 )
   Thing2 temp;
   Thing2 t1 = this;
   temp = t1;
   t1 = t2;
   t2 = temp;
 public void swap2( Thing2 t2 )
   int temp;
   temp = this.getCount();
   this.setCount( t2.getCount() );
   t2.setCount( temp );
 }
```

```
public class Question2
  public static void main( String[] args )
    Thing2 first = new Thing2( 5 );
   Thing2 second = new Thing2( 4 );
   Thing2 temp = first;
    first = second;
   second = temp;
    System.out.println( first.toString() );
   System.out.println( second.toString() );
    Thing2 third = new Thing2( 7 );
    Thing2 fourth = new Thing2( 6 );;
    third.swap2( fourth );
    System.out.println( third.toString() );
    System.out.println( fourth.toString() );
    first.setCount( third.getCount() );
    fourth = second;
    System.out.println( first == third );
    System.out.println( second == fourth );
    System.out.println( first.toString().equals( third.toString() ) );
    System.out.println( second.toString().equals( fourth.toString() ) );
    System.out.println( first.toString() );
    System.out.println( second.toString() );
    System.out.println( third.toString() );
    System.out.println( fourth.toString() );
    first = new Thing2( 4 );
    second = new Thing2( 7 );
    first.swap1( second );
    System.out.println( first.toString() );
                                                        Output
    System.out.println( second.toString() );
}
```

2

3) What output is produced by the following program?

```
public class Test3
 2
 3
      private static int a;
      private int b;
 4
 5
      private int c;
 6
      public static void main( String[] args )
 7
 8
        Test3 ref = new Test3(5);
 9
        ref.method1( ref.c );
10
11
      public Test3( int c )
12
        this.c = c;
13
14
15
      public void method1( int x )
16
        int c = ++x;
17
        int b;
18
19
        b = c + 3;
20
        a = b + 2i
21
        System.out.println( "Test3.a = " + Test3.a );
        System.out.println( "this.b = " + this.b );
2.2
        System.out.println( "this.c = " + this.c );
23
        System.out.println( "c = " + c );
24
        System.out.println( "b = " + b );
25
        System.out.println( "a = " + a );
26
        System.out.println( "result = " + method2( c + b ) );
2.7
        System.out.println( "Test3.a = " + Test3.a );
28
        System.out.println( "this.b = " + this.b );
29
        System.out.println( "this.c = " + this.c );
30
        System.out.println( "a = " + a );
31
        System.out.println( "b = " + b );
32
33
        System.out.println( "c = " + c );
        System.out.println( "x = " + x );
34
35
36
      private int method2( int x )
37
38
        int a = x;
39
        int c = this.c + Test3.a;
40
        x = b = a + ci
41
        System.out.println( "Test3.a = " + Test3.a );
        System.out.println( "this.b = " + this.b );
42
        System.out.println( "this.c = " + this.c );
43
44
        System.out.println( "a = " + a );
        System.out.println( "b = " + b );
45
        System.out.println( "c = " + c );
46
47
        Test3.a = a + 2;
        this.b = b + c;
```

48

49

50

51 }

return x + 3i

<u>Output</u> Test3.a = ____ this.b = _ this.c = _____ c = ____ b = ____ a = Test3.a = this.b = _____ this.c = ___ a = _____ b = C = result = _____ Test3.a = ____ $this.b = _{_}$ this.c = _____ a = b = _____ C = _____ x = __

Use the letters below to identify various program parts.

- A) class definition (type)
- F) instance method
- B) local variable
- G) static variable
- C) static method
- H) constructor
- D) instance variable
- I) formal parameter
- E) actual argument

| Test3() on line 11 | a | on line | 38 |
|--------------------|---|---------|----|
|--------------------|---|---------|----|

____ method2() on line 36 ____ c on line 5

_____ Test3 on line 1 a on line 3

ref.c on line 9 $\underline{}$ x on line 15

main() on line 6 ____ ref on line 8 4) What gets printed as a result of the call Q4(3, -1)?

```
public void Q4( int a, int b )
{
   if ( (a > 0) && (b > 0) )
   {
      if ( a > b )
      {
        System.out.println( "A" );
      }
      else
      {
        System.out.println( "B" );
      }
   else if ( (a < 0) || (b < 0) )
      {
        System.out.println( "C" );
    }
   else
      {
        System.out.println( "D" );
    }
}</pre>
```

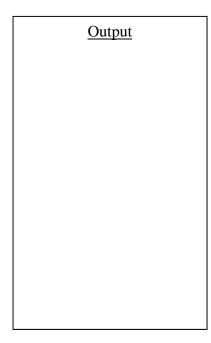
Give an example of values passed as arguments to Q4() that would result in the method printing "D".

```
Q4( _____);
```

What is the output of this recursive method if it is invoked as ref.mystery(9);? Draw Stack Frames to help you answer this question.

```
int mystery( int a )
{
   int b = a + 3;

   if ( b > 6 )
   {
      System.out.println( a + " " + b );
      a = b + mystery( a - 3 );
      System.out.println( a + " " + b );
   }
   else
   {
      System.out.println( a + " " + b );
      b = a - 4;
      System.out.println( a + " " + b );
      System.out.println( a + " " + b );
      System.out.println( "Whoa" );
   }
   return a + b;
}
```



5) Given the following definitions:

```
public interface Speakable
{
   public String speak();
}
```

And the following variable definitions:

```
private Puppy puppy;
private Kitty kitty;
private Speakable speakable;
```

Indicate what gets printed with the following statements (each statement is executed in the order it appears). If there is a compile time error, write "Error".

```
puppy = new Puppy();
kitty = new Kitty();
speakable = puppy;

System.out.println( speakable.getClass().getName() );

System.out.println( speakable.wag() );

System.out.println( speakable.speak() );

System.out.println( puppy.wag() );

speakable = kitty;

System.out.println( speakable.getClass().getName() );

System.out.println( kitty.wag() );

System.out.println( speakable.speak() );

System.out.println( speakable.speak() );

System.out.println( speakable.speak() );

System.out.println( speakable.sleep( 1000 ) );
```

What two things would we need to change in order to have Puppy objects listen for and handle ActionEvents? Be specific what needs to change in which file(s).

| 1) | |
|----|--|
| | |
| | |
| 2) | |

Scratch Paper