COSC 117 **Exam 1** Fall 2012

Name: _____

Part 1: Definitions & Short Answer (3 Points Each)

1. What does CPU stand for?

2. Explain the difference between high-level languages and machine language.

3. What is the difference between a compiler and an interpreter?

4. Java is a "platform-independent language." What does this mean?

5. What is a block statement?

6. What are the three types of programming errors? Briefly describe each of them.

7. What do each of the following do, &&, | |, !, and ^?

Part 2: Program Traces (15 Points Each)

1. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace1 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input w: ");
       double w = keyboard.nextDouble();
       System.out.print("Input x: ");
       double x = keyboard.nextDouble();
       System.out.print("Input y: ");
       int y = keyboard.nextInt();

       double z = x/4-y/2;
       w += z;
       int m = (int)z;
       int n = (y++) * (--m);

       System.out.println(x + " " + y + " " + z + " " + w + " " + m + " " + n);
   }
}
```

(a)

```
Input w: 3
Input x: 7
Input y: 11
```

(b)

```
Input w: 4
Input x: 8
Input y: 12
```

(c)

```
Input w: -3
Input x: -5
Input y: -9
```

2. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace2 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input x: ");
       int x = keyboard.nextInt();
       System.out.print("Input y: ");
       int y = keyboard.nextInt();

       if (x-y > 0){
          System.out.println("Part 1: (x-y > 0)");
       } else if (x-y < -10){
          System.out.println("Part 2: (x-y < -10)");
       } else if (2*x != 4*y){
          System.out.println("Part 3: (2*x != 4*y)");
       } else if (x*x+y*y <= 16){
          System.out.println("Part 4: (x*x+y*y < 16)");
       } else {
          System.out.println("None of the above. ");
       }
   }
}
```

(a)

```
Input x: 55
Input y: 28
```

(b)

```
Input x: 1
Input y: 3
```

(c)

```
Input x: -6
Input y: -3
```

(d)

```
Input x: -2
Input y: -1
```

3. For each of the program inputs below write the output of the program.

```
import java.util.Scanner;

public class Exam1Trace3 {
   public static void main(String[] args) {
      Scanner keyboard = new Scanner(System.in);
      System.out.print("Input n: ");
      int n = keyboard.nextInt();

      while (n > 0){
         if (n % 5 == 0){
            n = n/5;
         } else if (n % 3 == 0){
            n = n/3;
         } else if (n % 2 == 0){
            n = n/2;
         } else {
            n--;
         }
         System.out.print(n + " ");
      }
   }
}
```

(a)

```
Input n: 19
```

(b)

```
Input n: 129
```

(c)

```
Input n: 555
```

Part 3: Coding (15 Points Each)

1. Write a program that will take in a list of positive integers separated by a space and ending with 0. The program should find and output the length of the list, the average of the numbers in the list, and the minimum and maximum values in the list. The 0 that designates the end of the list should not be included in the calculations. If the list is empty the program should print out No List. A sample run of the program will produce the following output.

```
Input integer list: 7 4 5 3 6 7 5 4 5 8 9 0
List Length = 11
Average = 5.7272727272727275
Minimum = 3
Maximum = 9
```

```
import java.util.Scanner;

public class Exam1Code1 {
   public static void main(String[] args) {
      Scanner keyboard = new Scanner(System.in);
      System.out.print("Input integer list: ");









   }
}
```

2. In the game of Yahtzee, each player rolls 5 die and within three attempts tries to produce one of the needed configurations of face values. The configuration that earns the most points is the Yahtzee which is when all 5 dice have the same value. It is very uncommon for a player to obtain a Yahtzee in a single roll. Write a program that will simulate rolling 5 die and count the number rolls it takes to get a Yahtzee. A sample run is below.

```
Number of rolls = 4092
```

```
public class Exam1Code2 {
   public static void main(String[] args) {









   }
}
```

3. Write a program that will take an input a String and count the number of vowels and consonants. We will consider y to always be a consonant. A sample run is below.

```
Input the String: This Is A TesT of the CHARacter COunts
Vowels = 11
Consonants = 20
```

```
import java.util.Scanner;

public class Exam1Code3 {
   public static void main(String[] args) {
       Scanner keyboard = new Scanner(System.in);
       System.out.print("Input the String: ");
       String str = keyboard.nextLine();









   }
}
```