CSCI 1320
Fall 2014
Mid-Term Exam

Last Name: ____________________

First Name: ____________________

Write all of your answers on the answer sheets provided. You may write on this test paper, but the instructor will be looking for answers on the answer sheets.

1. (2 pts) Name one reason methods are a valuable tool.
2. (2 pts) State the "Golden Rule of Loops".
3. (2 pts) What is a try-catch block used for in Java?
4. (4 pts) Draw and label the diagram given in class that outlines the steps of converting Java source code into machine language.
5. Consider the following Java program and then answer the questions. When answering, you need to use proper terminology.

```
import java.util.Scanner;
public class MyFavoriteExam                       // line A
{
   public static void main(String [] args)    // line B
   {
      Scanner scan= new Scanner(System.in);   // line C
      int k,val,num=0;                        // line D
      System.out.print("Enter a number: ");   // line E
      k= scan.nextInt();                      // line F
      val= 1;                                 // line G
      while (val<=k)                          // line H
      {
         num= num + val;                      // line J
         val++;                               // line K
      }
      System.out.println(num);                // line L
   }
}
```

   (a) (2 pts) Which of the "six things a computer can do" discussed in class is *not* demonstrated in this program.

   (b) (4 pts) What would be output by this program if, when prompted, the user enters the value 4?

   (c) (3 pts) What error (if any) would result if line D was modified to this: `int k,val,num;`

   (d) (3 pts) The program currently uses a `while` loop. Which type of loop (`while`, `do-while`, or `for`) do you think would be the best choice for this program? Defend your answer.

6. Suppose the input buffer contains the following characters:

9	9	7	0	\n			3	0		3	4				\n	5		2	7	\n

Further assume the following variable declarations and initial values:

```
Scanner kb= new Scanner(System.in);
double x= 0.0;      int i= 5;
String s1="George", s2= "Mary";
```

(a) (8 pts) Write the value of the variables `i`, `x`, `s1`, and `s2` after the following input statements have been processed. Assume the input pointer starts at the beginning of the buffer.

```
s1= kb.next();
x= kb.nextDouble();
s2= kb.nextLine();
i= kb.nextInt();
```

(b) (2 pts) Where is the input pointer following the final input statement statement in problem 6a?

7. (2 pts each) State *the type and the value* of each expression assuming the following declarations and initial values. If the expression is *not* a valid Java expression then say so.

```
int   a= 12;
bool isLiked= true;
String size= "large";
double x= 6.0;
```

(a) `size.equals("LARGE") || x >= 6`

(b) `a + x`

(c) `a / 5 * 5`

(d) `size+a`

(e) `isLiked && !(x-a)`

(f) `a % 2`

(g) `(a+x) < 10 && isLiked`

8. (6 pts) Write a section of code that will use a loop to display the message "I love this test" 20 times.

9. (6 pts) Write a section of code that will allow a user to enter the radius of a circle and will display the corresponding area ($A = \pi r^2$). The program should keep asking for another radius until the user enters 0 or a negative number at which point the program should end without calculating or displaying the area.

10. (8 pts) Write a method called `getBattingAvg` that will prompt the user to enter a batting average in the range 0.000 to 1.000. The method should validate the input and return the entered batting average after a value in the proper range has been entered. Write your method to match the following sample output exactly (including blank lines, prompts, error messages, etc.):

```
Enter batting average: -0.001
ERROR: Must be in range 0.000 to 1.000

Enter batting average: 1.001
ERROR: Must be in range 0.000 to 1.000

Enter batting average (0.000-1.000): 0.321
```

11. (16 pts) Write a complete Java program that will allow a user to calculate a baseball team's average batting average. The code should work exactly as demonstrated by the following output:

```
Player 1
Enter batting average: 0.300
Enter another one? (y/n): y

Player 2
Enter batting average: 0.275
Enter another one? (y/n): y

Player 3
Enter batting average: 0.250
Enter another one? (y/n): n

Team batting average is: 0.275
```

The program should label precede each request for a batting average with "Player #" where the number is generated sequentially starting from 1. After getting each batting average the program should ask the user if they want to enter another one with "y" indicated yes and "n" indicating no. (Assume the user will cooperate and only enter either "y" or "n"). The program should continue requested batting averages until "n" is entered for that question.

The team batting average (an average of the individual batting averages) should be displayed once after all values have been entered.

IMPORTANT: You should assume that the method described in problem 10 already exists and has been correctly written and you should call it to get a a single batting average.