CMPS 11
Intermediate Programming
Spring 2017
Midterm Exam 1 Solutions

1. (20 Points) The following Java program contains five syntax errors. Each error is on a different line. Determine the line on which each error occurs, and write a short description of it. Assuming the errors are fixed, what is the output of the program?

```
1.  // Problem1.java
2.  Class Problem1{
3.     public static Void main( String[] args ){
4.        for( int i=1, i<=100; ++i){
5.           if( i%30==0 ){
6.              System.out.println(i);
7.           }else if( i%20=0 ){
8.              System.out.println(i)
9.           }
10.       }
11.    }
12. }
```

(3 Points) Line: 2 Syntax error: Class should be class

(3 Points) Line: 3 Syntax error: Void should be void

(3 Points) Line: 4 Syntax error: , should be ;

(3 Points) Line: 7 Syntax error: = should be ==

(3 Points) Line: 8 Syntax error: missing ;

(5 Points) Determine the output of the corrected program and write it on the lines below exactly as it would appear in a Unix terminal. (Note: more lines are provided than necessary.)

Program output:

```
20
30
40
60
80
90
100
```

2. (20 Points) Trace the following Java program and place its output, exactly as it would appear in the terminal window, on the lines provided below. (Again more lines are printed than needed.)

```
class Problem2{

   public static void main( String[] args ){

      int a=3, b=4, c;
      double x=2.0, y=3.5, z;
      c = f(a, b);
      z = g(x, c);
      a = h(y, z, x);
      x = f( (int)z, b);
      System.out.println(a + " " + b + " " + c );
      System.out.println(x + " " + y + " " + z );

   }

   static int f(int n, int m){
      int k = n + m;
      k *= 2;
      return k;
   }

   static double g(double s, int n){
      return n*s;
   }

   static int h(double r, double s, double t){
      int m = (int)(r + s + t);
      return f(m, 1);
   }

}
```

Program Output:

68 4 14
64.0 3.5 28.0

3. (20 Points) Complete the Java program below by carrying out the following steps. (1) Write a loop that gets a positive integer from the user and place it in the variable *n*. No prompts are necessary, but the loop should reject non-numeric strings and any input that cannot be interpreted as a positive integer. (2) Use a loop controled by the variable *i* to compute the sum of the integers from 1 to *n* ($1 + 2 + 3 + \cdots + n$) and store it in the variable *s*. (3) Compute the average of the integers from 1 to *n* and store it in the variable *avg*. (4) Print the average to the terminal window.

```
// Problem3.java
import java.util.Scanner;
class Problem3{
   public static void main(String[] args){

      Scanner sc = new Scanner(System.in);
      int i, n, s = 0;
      double avg;

      // get a positive integer from the user and store it in the
      // int variable n
      while(true){
         if(sc.hasNextInt()){
            n = sc.nextInt();
            if(n>0) break;
            else continue;
         }
         sc.next();
      }

      // compute the sum of the numbers from 1 to n: 1+2+3+..+n
      // and store it in the int variable s
      for(i=1; i<=n; i++){
         s += i;
      }

      // compute the average of the numbers from 1 to n and store
      // it in the double variable avg
      avg = s/(double)n;

      // print out the average
      System.out.println(avg);
   }
}
```

4. (20 Points) Determine the output of the following Java program. Assume that the user enters

```
one two 3 four 5.0 -6 7 eight 9 ten -11.0 12
```

on a single line, followed by return. Place the output on the lines below exactly as it would appear in the terminal window. (Again more lines are provided than needed.)

```
//   Problem4.java

import java.util.Scanner;
class Problem4{

   public static void main( String[] args ){

      Scanner sc = new Scanner(System.in);
      int i, foo=0;

      for(i=0; i<4; i++){

         while(true){

            while( !sc.hasNextInt() ){
               sc.next();
            }
            foo = sc.nextInt();
            if( foo>0 ){
               System.out.println(foo + " ");
               break;
            }

         }

      }
      System.out.println("\nBye!");
   }
}
```

Program Output:

3
7
9
12
Bye!

5. (20 Points) Write a complete syntactically correct Java program that prompts the user for two double values, stores them in two double variables *x* and *y*, then prints out the value of the expression

$$\frac{2 + x^2}{3y^3}$$

to the standard output stream. No checking of user input is necessary. Include all necessary import statements, a `class` definition and `main()` function. You may give the class any valid name. Specify the name of the file that contains your program in a one-line comment at the beginning of the program.

One of many possible solutions:

```
// Problem5.java
import java.util.Scanner;
class Problem5{

   public static void main(String[] args){

      Scanner sc = new Scanner(System.in);
      double x, y, z;

      System.out.print("Enter two doubles: ");
      x = sc.nextDouble();
      y = sc.nextDouble();

      z = (2+Math.pow(x,2))/3*Math.pow(y,3);

      // could also be
      // z = (2+x*x)/3*y*y*y;

      System.out.println(z);

   }
}
```