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?

```java
// Problem1.java
class Problem1{
    public static void main( String[] args ){
        for( int i=1, i<=100; ++i){
            if( i%30==0 ){
                System.out.println(i);
            }else if( i%20==0 ){
                System.out.println(i);
            }
        }
    }
}
```

(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
```
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 controlled 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.

```java
// 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

```
8 Monday 3 Friday 6.7 Thursday 14 Tuesday -20 Saturday 5
```
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.print(foo + " ");
                    break;
                }
            }
        }
        System.out.println("\nBye!");
    }
}
```

**Program Output:**

```
8 3 14 5
Bye!
```
5. (20 Points) Write a complete syntactically correct Java program that prompts the user for two double values \( x \) and \( y \), then prints out the value of the expression \( \frac{1}{\sqrt{x+y}} \). 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:

```java
// 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 = 1/Math.sqrt(x+y);
System.out.println(z);
    }
}
```