TOPIC 4 EXERCISES

Tracing Exercises

1. For each of these program segments, show what is printed. All variables have data type int.

(a)  sum = 0;
    for (int i = 1; i<= 10; i++)
        sum += i;
    System.out.println("the sum is " + sum);

(b)  count = 0;
    for (int i = 1; i <= 10; i++)
        count++;
    System.out.println("the count is " + count);

(c)  Scanner kybd = new Scanner(System.in);
    a = kybd.nextInt();
    b = kybd.nextInt();
    sum = 0;
    for (int i = a; i <= b; i++)
        sum += i;
    System.out.println("from " + a + " to " + b + " the sum is " + sum);

Answer part (c) three times. First, assume that the set of data consists of the two numbers 3 5; then answer the question assuming that the set of data is 1 6; then assume it is 5 5.

2. Show what is printed by each of the following:

(a)  int n;
    ...
    for (int j = 1; j <= 3; j++)
        for (int i= 1; i <= 4; i++)  {
            n = 10 * i + j;
            System.out.println(i + " " + j + " " + n);
        }
    System.out.println("\ndone");

(b)  int n;
    ...
    for (int i = 1; i <= 4; i++)
        for (int j = 1; j <= 3; j++)  {
            n = 10 * i + j;
            System.out.println(i + " " + j + " " + n);
        }
    System.out.println("\ndone");
3. Show what is printed by the following program:

```java
public class prob4_3 {
    public static void main(String[] args) {
        final int LIMIT = 10;
        int sum;

        for (int i = 1; i <= LIMIT; i++) {
            sum = 0;
            for (int j = 1; j <= i; j++)
                sum += j;
            System.out.println("When i equals " + i + " the sum is " + sum);
        }
    }
}
```

On the line defining the constant LIMIT, replace 10 by each of the following and repeat the program:
(a) 5    (b) 7    (c) 11    (d) 12

4. In each of the following, what is wrong with the indenting and aligning? Fix each one.

(a) for (int i = 1; i <= 4; i++)
    sum = ...
    System.out.println( ... ;

(b) for (int i = 1; i <= 4; i++)
    sum = ...
    System.out.println( ... ;

(c) if (hours < 40) pay = hours * rate;
    else pay = hours * rate + (hours - 40) * rate * 0.5;

(d) for (int row = 1; row <= 5; row++) {
    col = 1;
    while (col <= 4) {
        System.out.println(row + " " + col);
        col++;
    }
}

(e) if (x<0) System.out.println("yes"); else System.out.println("no");
    System.out.println();