

## 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:

```
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();
```