

Chapter 3 – Questions on Control Structures:

1. Write a “query-controlled” loop that will continue to input int values from the user, adding each to the int value sum, and then ask if the user has another value to input, until the user says that there are no more values. In general, a **query** is a form of [questioning](#), in a line of inquiry.

2. Show the output that would occur from the following code, including proper spacing.

```
for(j = 0; j < 5; j++)
{
    for(k = 0; k < 5; k++)
        if(j!=k) System.out.print(' ');
        else System.out.print('*');
    System.out.println( );
}
```

3. Given the following tax table information, write Java code to assign the double taxRate appropriately given the double pay.

If pay is more than 100,000, tax rate is 40%
If pay is more than 60,000 and less than or equal to 100,000, tax rate is 30%
If pay is more than 30,000 and less than or equal to 60,000, tax rate is 20%
If pay is more than 15,000 and less than or equal to 30,000, tax rate is 10%
If pay is more than 5,000 and less than or equal to 15,000, tax rate is 5%
If pay is less than or equal to 5,000, tax rate is 0%

4. Write code that inputs a set of int values and computes its average. Ask the user first how many int values will be input. Make sure that your code cannot produce a division by zero error.
5. A truth table shows, for the various true or false values of boolean variables, what the result of a boolean condition is. Fill in the following truth table. Assume that a, b and c are boolean variables.

| a | b | c | a && (!b c) |
|-------|-------|-------|----------------|
| false | false | false | |
| false | false | true | |
| false | true | false | |
| false | true | true | |
| true | false | false | |
| true | false | true | |
| true | true | false | |
| true | true | true | |

6. A data verification loop is a loop that asks the user to input a value within a restricted range repeatedly until the user has input a value within the requested range. Write a data verification loop that that inputs an int value x within the range 0 and 100.
7. The following for-loop is odd in that the loop increment value changes during iterations of the loop. Determine the number of times the loop iterates and the final value of j after the loop terminates.

```
int k = 0;
for (j = 0; j < 20; j += k)
    k++;
```
8. Write a set of code that outputs all of the int values between 1 and 100 with 5 values per line, and each of those 5 values spaced out equally. Use a single for-loop to solve this problem.
9. The following code has a syntax error immediately before the word else. What is the error and why does it arise? Fix the code so that this statement is a legal if-else statement.

```
if (x < 0) ; x++;
else x--;
```
10. String s1 is said to overlap String s2 if all of the characters in s1 also appear in s2. Write a set of code that will set the boolean variable overlap to true if s1 overlaps s2 and false otherwise. Assume both s1 and s2 have already been input.