# CS-141 Nested Loop Problems

1. What is the output of the following?    Explain.

```
int cnt = 0;
for (int j = 0; j < 5; j++) {
   for (int i = 0; i < 6; i++) {
        cnt++;
   }
 }
 System.out.println("cnt = " + cnt);
```

2. What is the output of the following?    Explain.

```
int cnt = 0;
for (int j = 0; j < 5; j++) {
   cnt++;
   for (int i = 0; i < 6; i++) {
        cnt++;
   }
 }
 System.out.println("cnt = " + cnt);
```

3. Write a nested for-loop that prints (8 rows and 10 columns)

```
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *  *
```

4. Add numbering to each row in problem 1:

```
0  *  *  *  *  *  *  *  *  *  *
1  *  *  *  *  *  *  *  *  *  *
2  *  *  *  *  *  *  *  *  *  *
3  *  *  *  *  *  *  *  *  *  *
4  *  *  *  *  *  *  *  *  *  *
5  *  *  *  *  *  *  *  *  *  *
6  *  *  *  *  *  *  *  *  *  *
7  *  *  *  *  *  *  *  *  *  *
```

5. Modify problem 2 to give the triangular shape below (do not use an if-else statement – just modify the bounds of one of the loops instead):

```
0
1   *
2   *   *
3   *   *   *
4   *   *   *   *
5   *   *   *   *   *
6   *   *   *   *   *   *
7   *   *   *   *   *   *   *
```

6. Modify problem 2 to give the triangular shape below (do not use an if-else statement – just modify the bounds of one of the loops instead):

```
0   *   *   *   *   *   *   *   *   *   *
1   *   *   *   *   *   *   *   *   *
2   *   *   *   *   *   *   *   *
3   *   *   *   *   *   *   *
4   *   *   *   *   *   *
5   *   *   *   *   *
6   *   *   *   *
7   *   *   *
```

7. Add an if-else statement to problem 2 to eliminate one column:

```
0   *   *   *   *       *   *   *   *   *
1   *   *   *   *       *   *   *   *   *
2   *   *   *   *       *   *   *   *   *
3   *   *   *   *       *   *   *   *   *
4   *   *   *   *       *   *   *   *   *
5   *   *   *   *       *   *   *   *   *
6   *   *   *   *       *   *   *   *   *
7   *   *   *   *       *   *   *   *   *
```

8. Add an if statement to problem 2 to eliminate one row:

```
0   *   *   *   *   *   *   *   *   *   *
1   *   *   *   *   *   *   *   *   *   *
2   *   *   *   *   *   *   *   *   *   *
3   *   *   *   *   *   *   *   *   *   *
4
5   *   *   *   *   *   *   *   *   *   *
6   *   *   *   *   *   *   *   *   *   *
7   *   *   *   *   *   *   *   *   *   *
```

9. To problem 2, add an if-else statement (with a condition that makes use of the mod function) to generate the checkerboard pattern:

```
0 *     *     *     *     *
1    *     *     *     *     *
2 *     *     *     *     *
3    *     *     *     *     *
4 *     *     *     *     *
5    *     *     *     *     *
6 *     *     *     *     *
7    *     *     *     *     *
```

10. Use for-loops to print the multiplication table. Use tabs (the escape sequence "\t") for the spacing:

```
Multiplication Table
        0    1    2    3    4    5
0       0    0    0    0    0    0
1       0    1    2    3    4    5
2       0    2    4    6    8    10
3       0    3    6    9    12   15
4       0    4    8    12   16   20
5       0    5    10   15   20   25
```

If you don't know how to begin, break the problem into easier parts:
a. Do a single for-loop to generate the top labels:

```
Multiplication Table
        0    1    2    3    4    5
```

b. Do a *second separate* for-loop to generate the side labels to give
```
Multiplication Table
        0    1    2    3    4    5
0
1
2
3
4
5
```

c. Add a nested loop *inside of the second loop*, in order to generate the table contents.