Lab 7
Name:_________________________ Checked:____

Objectives:
Practice switch statements and loops.

Preparation:
1. Make a copy of AllCaps.java from Lab 5 into your Lab 7 folder. Modify the code to: (a) print the name backwards; and (b) output the number of vowels in the name. For example, an interaction might look like this:

```
Please enter your name: Grace
Hello...
$ E ***
$ C ***
$ A ***
$ R ***
$ G ***
Your name contains 2 vowels.
```

**Hint:** Set up an extra counter to count the vowels, initially zero. As you loop through the string, after printing each character, if it is a vowel (i.e., it equals ‘A’ or it equals ‘E’, etc.), increment the vowel counter.

2. Write a program Box.java to input a number n and have it print a grid of n×n asterisks. For example, if the input is 4, your program should display:

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

(This is similar to the example Stars.java.)

Upload and submit AllCaps.java and Box.java through blackboard.

Part A
Modify AllCaps.java from the preparation so that it prints the number of vowels as an English word. In the example above, instead of printing “Your name contains 2 vowels.” it should print: “Your name contains two vowels.”

**Hint:** use a switch statement.

Part B
Modify Box.java from the lab preparation, so that it now includes line labels. For example, if the input is 4, the output should look like this:

```
1 ****
2 ****
3 ****
4 ****
```

Part C
Repeat with Stars.java
For example, if the input is 5, the program should display:

```
1 ****
2 ****
3 ****
4 ****
5 ****
```

Part D
Repeat the above exercise, modifying to create the upside down triangle:

```
5 *****
4 *****
3 ****
2 **
1 *
```
Part E
Repeat the above exercises with labels on BOTH SIDES. For example, with input 4:

```
1     ****    1
2     ****    2
3     ****    3
4     ****    4
4     ****    4
3     ***     3
2     **      2
1     *       1
```

**Hint:** In order to get the numbers to line up on the right, you need to add the correct number of spaces after the asterisks. You might be tempted to use a tab ("\t") to do this, but it only works for small numbers, like 4. Your code needs to function correctly when the input is 10 or 20.

**Challenge:** Can you figure out how to print a WAVE?
*(Hint: use a trig function)*
Lab 7 Comments

Comments on this lab, please:

What was the most valuable thing you learned in this lab?

What did you like best about this lab?

Was there any particular problem?

Do you have any suggestions for improving this lab as an effective learning experience?