Java Basics

Homework 1

Problem 1: Multiplication Table

- Produce the following output by filling out the missing parts in the given code.

Output

```
3 times 1 = 3
3 times 2 = 6
3 times 3 = 9
…
3 times 9 = 27
```

Code

```
public class MultTable {
  public static void main(String[] args) {
    for (int i = /* FINISH ME */) {
      System.out.println(/* FINISH ME */);
    }
  }
}
```

Problem 2: Fibonacci Numbers

- Write a program (using loops) that prints out the first 12 Fibonacci numbers.
- The Fibonacci numbers are a sequence of integers in which the first two elements are 1, and each following element is the sum of the two preceding elements.
- The first 12 Fibonacci numbers are: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144

Problem 3:

- Produce the following output by filling out the missing parts in the given code. (Input is a integer number)

Console

```
1                                  # input
Year 1 student is freshman.        # output
2                                  # input
Year 2 student is sophomore.       # output
3                                  # input
Year 3 student is junior.          # output
4                                  # input
Year 4 student is senior.          # output
5                                  # input
There is no 5 year in university.  # output
```

Main Function

```
Scanner scanner = new Scanner(System.in);
while (true) {
  int year = scanner.nextInt();
  String word;
  switch (/* FINISH ME */) {
    /* FINISH ME */
    default:
      word = null;
  }
  if (word == null) {
    System.out.println(/* FINISH ME */);
  } else {
    System.out.println(/* FINISH ME */);
  }
}
```

Problem 4:

- Fill out the missing parts of `longerThan` function.
- `longerThan` returns true is the input `String` is longer than the input `int`.
- The function should not throw any error even the input `String` is `null`.
- Use only one line.

```
static boolean longerThan(String input, int length) {
  return /* FINISH ME */;
}
```

Problem 5: Drawing Figures

- Write a program that takes in a number from 1 through 6 and outputs a corresponding figure as shown below.

Size 3

```
//////////////////////\\\\\\\\\\\\\\\\\\\\\\
////////////////********\\\\\\\\\\\\\\\\\\\\
//////////**************\\\\\\\\\\
```

Size 6

```
//////////////////////\\\\\\\\\\\\\\\\\\\\\\
////////////////********\\\\\\\\\\\\\\\\\\\\
//////////**************\\\\\\\\\\
///////************************\\\\\\\
///**********************************\\\\
**************************************
```

Problem 6: Character Counter

- Write a program that
  a. takes in an arbitrary string composed only of alphabets,
  b. counts the number of the alphabets that are in that string, and
  c. outputs the alphabet and the corresponding count in a decreasing order.
- If any two alphabets have the same count, the print order does not matter.

Input	Output
aaaabbccaaaaccbbaacdddeeef	a 10 c 5 b 4 e 3 d 3 f 1