Exercises

1. Write a program, `SalesCalculator`, which declares and initializes the amount of a purchase. The program should then compute the state and country sales tax. Assume the state sales tax is 4 percent and the country sales tax is 2 percent. The program should display:
   a) The amount of purchase
   b) The state sales tax
   c) The country sales tax
   d) The total sales tax
   e) And the total of the sales (the sum of the amount of the purchase plus the total sales tax)

2. Write a program, `Split`, that declares a 9-digit number and then prints each digit with a space between them. The digits should be printed out from the least significant digit to the most significant one. You must use a *for loop* to solve this problem. In the following sample output, the chosen value appears in bold:

```
The original number is: 123456789
The individual digits of 123456789 are 9 8 7 6 5 4 3 2 1
```

3. Write a program, `BinaryToDecimal`, that declares and initializes a binary number, then convert the number to decimal and display it on the screen. The following is a sample run of the program; the chosen value appears in bold.

```
The binary number 10111 is equivalent to 23 in decimal.
```

4. This problem is divided into three parts:
   a) In the first part, you have to write a program, `Triangles`, to display the following output on the screen. You must use regular `System.out.print` statements:

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

   b) In the second part, you have to write a program, `TrianglesUsingMethods`, to display the same output, but using static methods. First, create a static method named `upperTriangle` to display the first three lines of the output. Then, create another static method named `lowerTriangle` to display lines 4, 5 and 6 of the output. Finally call the static methods from the `main` method to display the output presented above.

   c) In the third part, you have to write a java program, `TrianglesUsingLoops`, to display the same output using static methods similar to the ones indicated in part b), but this time the static methods should draw the triangles using *for loops.*

5. Write a program `Leap`, which declares and initializes a positive integer variable that represents a year number and prints true if the year is leap and false otherwise. A leap year is a year divisible by 4 but not by 100, or is divisible by 400. In the following sample output, the chosen value appears in bold:

```
Is year 2000 a leap year: true
Is year 1440 a leap year: true
Is year 2014 leap year: false
```

Submission Instructions and Guidlines

- Your submission must consist of a single zip folder that contains seven `.java` files only (**`SalesCalculator.java`**, **`Split.java`**, **`BinaryToDecimal.java`**, **`Triangles.java`**, **`TrianglesUsingMethods.java`**, **`TrianglesUsingLoops.java`**, and **`Leap.java`**). No additional files should exist in the .zip folder.
- Give meaningful names to your methods and variables in your code.
- Include a comment at the beginning of your program with basic information about yourself and a description of the program. Include also a comment at the start of each method.
- The name of the zip file must adhere to the following naming convention `s#_A3_`*`netid`*, where # stands for your section number (between 1 and 12) and *`netid`* stands for your AUBnet user name. For example, if your AUBnetid is abc65 and you are in section 4, you should submit the following file: `s4_A3_abc65.zip`. The zip files will be processed automatically so please make sure you use this naming convention.
- **Failing to follow these guidelines will result in deducting marks form your grade.**