For this homework, you will write 4 methods. You will be graded based on

- **Correctness**
  - Do the methods work as specified?
  - Do the methods have appropriate input and output types?
  - Has code been written to test the methods based on the examples provided?

- **Descriptive variable and method names.**

- **Comments.**

**Question 1**

Write a method that takes one integer as input and prints the Hailstone sequence (from the Collatz Conjecture) of the integer and then prints the string "Finished".

This method should return void.

Then, in the main method, write code to call the method with each of the following inputs so that you and the grader can both verify that the program works correctly.

Examples:

Input: 5  
Output: 5, 16, 8, 4, 2, Finished

Input: 16 
Output: 16, 8, 4, 2, Finished

Input: -6  
Output: Finished

**Question 2**

Write a method that takes as input three floats: an “x” value, a slope, and a y-intercept and **returns** the corresponding y value of the linear function of these values. The method should take three parameters, aka arguments, aka inputs.

The y value should be returned by the method, not printed to the console. After y is returned, then it should be printed with the format as in the following example.
In the main method, write code to call the method with the following input and print the corresponding output.

Examples:

Input:  
Slope: 3.5  
Intercept: 10.0  
X value: 9.5  
Output: 43.25

**Question 3**

Write a method that takes a string as input. The method should trim whitespace from the front and end of the string. Then, if the string’s third letter is A, return the string entirely in upper case. Otherwise, return the string entirely in lower case.

This method has one argument of type String and returns one value of type String. The method itself does not print anything to the command line.

The following methods will make your life easier when answering this question:

* trim to remove whitespace [http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#trim()](http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#trim())
* toUpperCase [http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#toUpperCase()](http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#toUpperCase())
* toLowerCase [http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#toLowerCase()](http://docs.oracle.com/javase/1.4.2/docs/api/java/lang/String.html#toLowerCase())

In the main method, write code to call the method with the following inputs and print the corresponding outputs.

Examples:

Input: ‘Williams’  
Output: ‘williams’
Input: ‘SeAhOrSe’  
Output: ‘SEAHORSE’
Input: ‘IT’  
Output: ‘it’
Input: ‘weak’  
Output: ‘WEAK’

**Question 4**

Write a method that takes an int and returns true if the integer is prime and returns false otherwise. Recall that an integer is prime if it is divisible only by one and itself. One is not prime. We will treat all negative numbers as not prime.

Further recall that \( i \% 2 == 0 \) implies that \( i \) is divisible by 2.

In the main method, write code to call the method with the following inputs and print the corresponding outputs.

Examples:

Input: 7  
Output: true
Input: 144  
Output: false
Input: -11  
Output: false

**Question 4 continued on next page...**
<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
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<tbody>
<tr>
<td>0</td>
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<tr>
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<tr>
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</tr>
<tr>
<td>1511</td>
<td>true</td>
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