1 Assignment 1

Submit source code and running instructions to EAS[1]. Submit the textual component as a block comment at the top of your code. Do it in Java. Do not use java's search methods! Place textual responses for 2 and 3 in block comments in your code.

This assignment should use Command-Line. Not Scanner, not anything else. Command-Line input. Learn what String[] args are for in the main method! Similar, but a bit smarter, to what you may have used in C++.

Posted: Tuesday, July 3^{rd}

Due: Sunday, July 9^{th}

Grade: 5%

1. You have the following array $1, 5, 17, 22, 33, 37$, known to be sorted. Write a program that demonstrates a $\Theta(\log(n))$ time or better (in the average case) algorithm to determine if the value 5 is in that array. **A reminder, the $\Theta(\log(n))$ restriction applies only to finding the value, not setting up values from stdin**.
   (a) Make sure your program allows as input on the command-line a comma-separated (free of spaces) list of integers (the above being just an example).
      i. The list should be known to be sorted
      ii. The file name should be BSort.java
      iii. e.g.: java BSort 2,4,6,7,8,9,12,17,22,28 7
   (b) As output to stdout, each step along the way, on a single line, indicate what value you checked, followed by the symbol $<$, $>$ or $=$. e.g. The last line for this example would be "5=" (without the quotes)
   (c) If the searched for value is not found, the last line should simply be a "!" (without the quotes)
2. In clear, natural language, give the name of your algorithm and explain in a generalized step-wise manner how it can be applied to an arbitrary sorted array when searching for an arbitrary value.
   (a) This textual response should be no more than 5 lines / 50 words.
3. In clear, natural language, describe how you would change your algorithm to search over sorted Strings instead of integers.
   (a) This textual response should be no more than 4 lines / 40 words.

[1] https://fis.encs.concordia.ca/eas/