

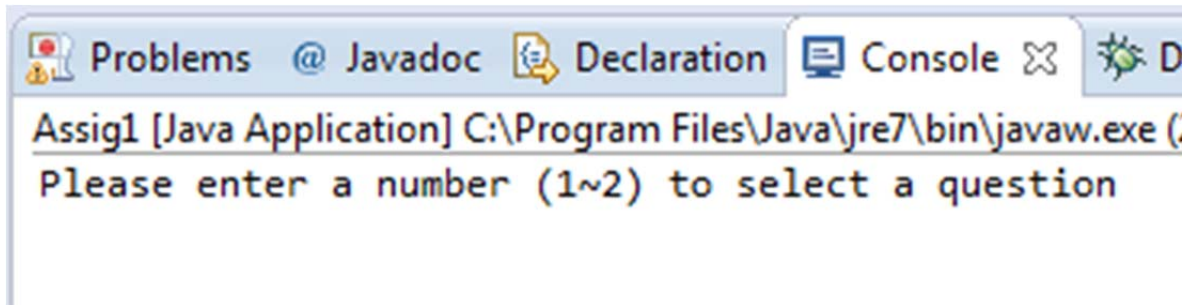
## Laboratory Eight

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### Activity 0: Preparation

1. Create a project called “lab8” under Eclipse;
2. Copy “lab8.java” into project;
3. Copy “questions.java” into project;

Make sure your program can run correctly. An expected output of the UI is shown below.



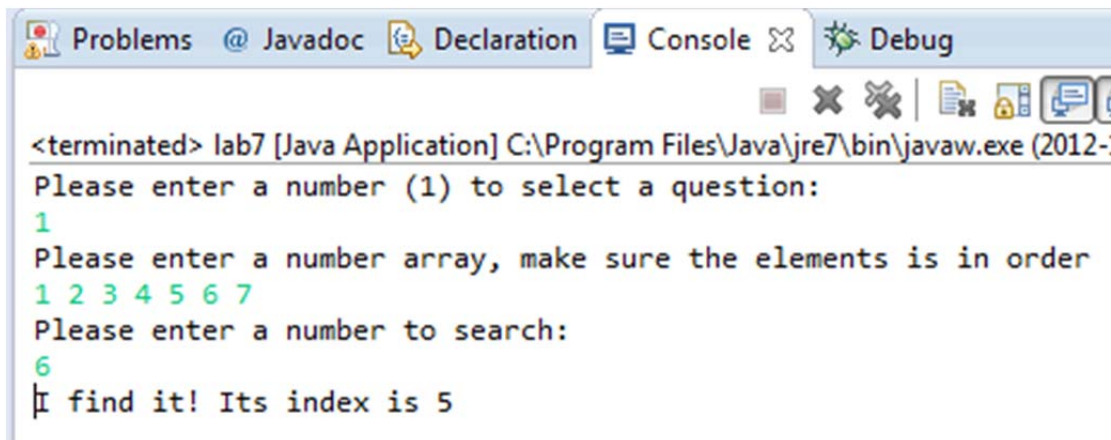
### Activity 1: A Recursive Binary Search (8 marks)

The purpose of this lab is to become familiar with the binary search algorithm, and the efficiency differences between iterative versions of algorithms and recursive versions of algorithms.

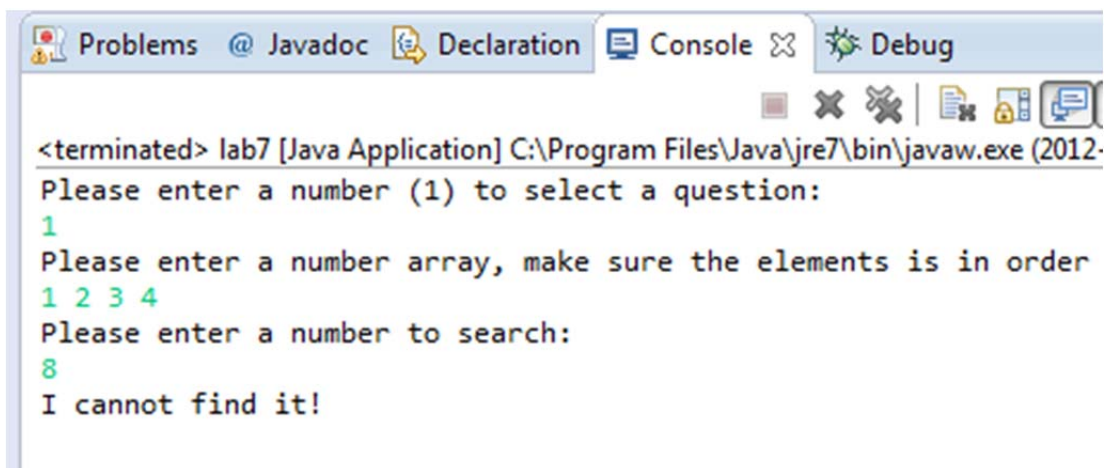
In *questions.java*, a method called “*binarySearch*” is defined, please finish the method body to do recursively binary search.

In *q1*, please write a program which can accept user’s input and transfer it into a number array. Note the length of array is not fixed, which should be decided based on user’s input.

An expected output is shown below.



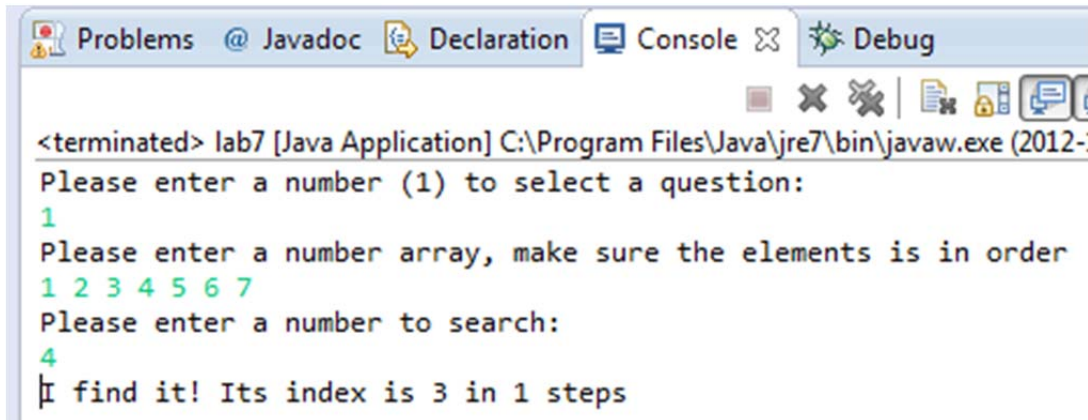
```
<terminated> lab7 [Java Application] C:\Program Files\Java\jre7\bin\javaw.exe (2012-  
Please enter a number (1) to select a question:  
1  
Please enter a number array, make sure the elements is in order  
1 2 3 4 5 6 7  
Please enter a number to search:  
6  
I find it! Its index is 5
```



```
<terminated> lab7 [Java Application] C:\Program Files\Java\jre7\bin\javaw.exe (2012-  
Please enter a number (1) to select a question:  
1  
Please enter a number array, make sure the elements is in order  
1 2 3 4  
Please enter a number to search:  
8  
I cannot find it!
```

## Activity 2: Step counting (2 marks)

Now, edit our “*binarySearch*” and make it count the number of comparisons. An expected output is shown below.



```
<terminated> lab7 [Java Application] C:\Program Files\Java\jre7\bin\javaw.exe (2012-)
Please enter a number (1) to select a question:
1
Please enter a number array, make sure the elements is in order
1 2 3 4 5 6 7
Please enter a number to search:
4
I find it! Its index is 3 in 1 steps
```

## What need to be submitted?

Please submit the following files:

- questioning.java

=====The end of Lab 8=====