

STHZAK001

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CSC2001F: Assignment 1 Report

Part 1 and Part 3

In order to accomplish the task required by Part 1, 2, 3 and 4 I created LSArraryApp which contains 1 array, which stores the data in the load shedding data and the information about the area and which is affected by the stage, day and startTime is embedded inside so if the user wants to know information for a certain day, stage and time can run the LSArraryApp with 3 inputs containing the requested information and that input is taken in and run into methods that are within the code like for instead find and comparison to get the information that maps the one requested and gets to be prepared to be printed out.

I also created a method within one of the classes to read the file data and append every information into an array.

This class also included methods like printAreas (stage, day, startTime) to be used to print out the list of areas for the first matching combination of the supplied parameters that is found; or "Areas not found" if there is no match. And which used a string as an argument to be compared with the data, that incrementing the number of counts it took to find it in the list, we are having from our txt file and then printing out the corresponding areas and also printAllAreas() to print out the areas for every stage, day and start time, in any order.

Following are screenshots of the code Working in different outputs with the testing values being the one on the command line next to class name so mine takes in the input from the command line just right after the java class name.

The goal for the assignment was to see which one is more faster than the other one in terms of searching for something in a txt file like how many comparison test does each date/time takes both the BST and Array to find it and Print out its value but the BST was more sufficient given its best case is $O(\log n)$ n being the number of items and for an array is $O(n)$ meaning it's takes the number of times that are equivalent with your position when searching. Provided screen shorts to support this...

Testing with 3 known parameter combination that works, 3 Invalid and No Parameters

Part 1 - 2: Results

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "2" "3" "04"
Mar 05, 2020 4:34:46 AM LSArraryApp main
INFO: The Areas are : 3, 11
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "5" "6" "12"
Mar 05, 2020 4:34:57 AM LSArraryApp main
INFO: The Areas are : 8, 16, 4, 12, 5
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "1" "16" "00"
Mar 05, 2020 4:35:16 AM LSArraryApp main
INFO: The Areas are : 8
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that works

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "2" "3" "86"
Mar 05, 2020 4:25:57 AM LSArraryApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "2" "3" "78"
Mar 05, 2020 4:26:02 AM LSArraryApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "2" "3"
Invalid arguments to main function
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that are invalid

```
Areas : 14, 6, 10, 2, 11, 3, 7, 15
Slot 8_9_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_25_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_10_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_26_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_11_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_27_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_12_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_28_22
Areas : 14, 6, 10, 2, 15, 7, 11, 3
Slot 8_13_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_29_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_14_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_30_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_15_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_31_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
Slot 8_16_22
Areas : 15, 7, 11, 3, 12, 4, 8, 16
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

No Entries

Part 2: Continuing

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ javac *.java
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "3" "19" "00"
Mar 05, 2020 4:41:00 AM LSArraryApp main
INFO: The Areas are : 1, 9, 5
comparison
750
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "6" "10" "04"
Mar 05, 2020 4:41:21 AM LSArraryApp main
INFO: The Areas are : 5, 13, 1, 9, 2, 10
comparison
2085
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "8" "30" "12"
Mar 05, 2020 4:41:38 AM LSArraryApp main
INFO: The Areas are : 10, 2, 6, 14, 7, 15, 3, 11
comparison
2898
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that works

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "8" "30"
Invalid arguments to main function
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "8" "30" "24"
Mar 05, 2020 4:43:40 AM LSArraryApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "19" "30" "02"
Mar 05, 2020 4:47:18 AM LSArraryApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp "8" "32" "00"
Mar 05, 2020 4:48:38 AM LSArraryApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that are invalid

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArraryApp
Slot 1_1_00
Areas : 1
Slot 1_17_00
Areas : 1
Slot 1_2_00
Areas : 13
Slot 1_18_00
Areas : 13
Slot 1_3_00
Areas : 9
Slot 1_19_00
Areas : 9
Slot 1_4_00
Areas : 5
Slot 1_20_00
Areas : 5
Slot 1_5_00
Areas : 2
Slot 1_21_00
```

No Parameters Passed In/No Entries

Part 3 - 4: Results

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "3" "19" "00"
Mar 05, 2020 4:53:04 AM LSBSTApp main
INFO: The areas are: 1, 9, 5
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "1" "31" "05"
Mar 05, 2020 4:53:19 AM LSBSTApp main
INFO: No Areas Found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "8" "24" "09"
Mar 05, 2020 4:53:38 AM LSBSTApp main
INFO: No Areas Found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that works

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "8" "32" "00"
Mar 05, 2020 4:55:05 AM LSBSTApp main
INFO: No Areas Found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "8" "32"
Invalid arguments to main function
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp "10" "32" "00"
Mar 05, 2020 4:55:26 AM LSBSTApp main
INFO: No Areas Found
```

3 known parameter combination that are invalid

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSBSTApp
Slot 1_10_00
Areas : 15
Slot 1_10_02
Areas : 16
Slot 1_10_04
Areas : 1
Slot 1_10_06
Areas : 2
Slot 1_10_08
Areas : 3
Slot 1_10_10
Areas : 4
Slot 1_10_12
Areas : 5
Slot 1_10_14
Areas : 6
Slot 1_10_16
Areas : 7
Slot 1_10_18
Areas : 8
Slot 1_10_20
Areas : 9
```

No Parameters Passed In/No Entries

Part 4: Continuing

```
"2" "3" "04"
Mar 05, 2020 5:01:58 AM LSArrayApp main
INFO: The Areas are : 3, 11
comparison
439
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
"2" "3" "10"
Mar 05, 2020 5:02:04 AM LSArrayApp main
INFO: The Areas are : 6, 14
comparison
532
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
"2" "3" "00"
Mar 05, 2020 5:02:15 AM LSArrayApp main
INFO: The Areas are : 1, 9
comparison
377
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$
```

3 known parameter combination that works

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
"6" "7"
Invalid arguments to main function
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
"5" "32" "09"
Mar 05, 2020 5:03:56 AM LSArrayApp main
INFO: Areas not found
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
"20" "3" "04"
Mar 05, 2020 5:04:17 AM LSArrayApp main
INFO: Areas not found
```

3 known parameter combination that are invalid

```
jobe-jr@jobejr-VirtualBox:~/Desktop/Assignments/Assignment_1$ java LSArrayApp
Slot 1_1_00
Areas : 1
Slot 1_17_00
Areas : 1
Slot 1_2_00
Areas : 13
Slot 1_18_00
Areas : 13
Slot 1_3_00
Areas : 9
```

No Parameters Passed In/No Entries

Results:

What I discovered with the LSTArrayApp for a user to find the number of operation counts of a certain date you have to iterate through the long list of data and the counts will be the position of the matching data plus one and depending on your array size that's how your cases differ more data more operation counts as best case is $O(\log n)$.

LSBSTApp has the fastest way of discovering the matching date/time because it doesn't store its data on an array but rather on a tree with a node and left or right if it happens it is greater than the root then it will be on the right if it is less than the root then it will be placed on the left and it depends on the data you have you can also have sub-trees making it easy for the user to find the corresponding data in a quicker time do I this way number of operation counts doesn't depend of the number of items you having rather the number of nodes you have. BinarySearchTree is the best when it comes to finding something.

How to run:

To run the code or programs you need to go to the src folder on the terminal then type in `java "name-of-program" "input"` press enter to run the program o then this will return corresponding areas for that requested stage, date and startTime.

If there's no input, it will print out all the areas.