Write a java program (**using java.io.RandomAccessFile class)** that takes a binary file containing a set of integers as input and do the following tasks on it:

1- Sort the data in the file using n-way merge sort.
2- Do a binary search on the sorted file.

In order to deliver your program, you **must** use the following functions header:

String [] DivideInputFileIntoNRuns (String Inputfilename, int runSize) (1 grade)

String [] SortEachRunOnMemoryAndWriteItBack (String [] RunsFilesNames) (0.5 grade)

void DisplayRunsContent (String [] RunsFilesNames) (0.5 grade)

void DoNWayMergeAndWriteASortedFile(String [] SortedRunsNames, int N ,String Sortedfilename) (2 Grade) // You should Display the sorted file after merging is done.

int BinarySearchOnSortedFile(String Sortedfilename, int SearchValue) (2 Grade)

Important Notes:

- You are required to implement n-way merge with a variable run size (Attached with the assignment an input file containing 64 integer to be sorted and searched)
- You can't do n-way merge or Binary search on memory (**Don't** transfer All data into memory to do the operations) , doing this will give you an automatic Zero on the assignment
- You are **only** allowed to sort each run into memory ("**SortEachRunOnMemoryAndWriteItBack**")
    - Implementing Heap Sort to sort data on memory will give you 1 Bonus grade (Only if you understand the code of heap sort).
- Binary Search should return either the index of value you are searching on the sorted file or -1 if the value is not found.

Assignment Delivery On the week starting **2/4** on your lab

Assignment should be done **individually only**. All the submitted code must be completely yours. Your grade depends on delivering a running code and your understanding for the code.