# ITEC 3150

## Homework 4 - Multithreading Assignment

Reminder: NO LATE ASSIGNMENTS ACCEPTED

In this homework, you will implement a multithreaded solution to finding the sum of 10,000,000 integer values. A class named InitializedArray is attached that reads the values from a file named bigdata.txt and places them into an ArrayList<Integer>.

Your program will create 5 separate threads which each sum up an equal number of the array elements independently. Upon completion, each worker thread adds its total to the shared sum. DO NOT ADD EACH INDIVIDUAL ELEMENT TO THE SHARED SUM - THAT DEFEATS THE PONT OF MULTITHREADING.

The shared sum should be in its own class with public methods to add to and get the sum, protected using appropriate locks. The shared sum should initialize to 0.

Your main method should initialize the ArrayList with provided code, divide the big array into 5 smaller arrays, launch the appropriate threads (passing one of the smaller arrays to it and the shared sum class), and wait for their completion. The overall shared sum should be printed.

User interface will be minimal, but you may print some interim statements like – “Thread Complete- Array Sum = xxxxxxxx“, if it makes you comfortable that program is working.

Grading Criteria

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| --- | --- |
| Creates Runnable class for summing threads | 25 |
| Appropriately launches 5 separate threads | 15 |
| Updates the sum correctly | 15 |
| Appropriately protects shared data (sum) with lock(s) | 15 |
| Prints total sum in a readable fashion | 15 |
| Meets coding standards | 15 |

Submission

* Please include both InitializedArray.java and bigdata.txt in your solution.
* Submit your zipped project file (IntelliJ)
* Provide an expository video describing your solution. Recall this video will help with creation of your video. The video must be uploaded or shared privately. Missing or incorrect videos will result in a grade of zero.