

Seneca College

Applied Arts & Technology
SCHOOL OF COMPUTER STUDIES

JAC444

Submission date:07-08-2022

Date:30-07-2022

Workshop 9

Workshop Header (to be included with every file)

/*****

Workshop #

Course:<subject type> - Semester

Last Name:<student last name>

First Name:<student first name>

ID:<student ID>

Section:<section name>

This assignment represents my own work in accordance with Seneca Academic Policy.

Signature

Date:<submission date>

*****/

Code Submission Criteria:

Please note that you should have:

- Appropriate indentation.
- Proper file structure
- Follow java naming convention
- Document all the classes properly
- Do Not have any debug/ useless code and/ or files in the assignment

Deliverables and Important Notes:

All these deliverables are to be uploaded on the blackboard once done.

• You are supposed to create video of your running solution for each task along with demo. It should include voice over explaining the logic and code. You can use diagram like flow charts to aid your explanation. **(40%)**

o Screen Video captured file should state your last name and id, like Ali_123456.mp4 (or whatever the extension of the file is)

• A word/ text file which will reflect on learning of your concepts or any new class in this workshop. Also include the instructions on how to run your code. **(30%)**

Seneca College

Applied Arts & Technology
SCHOOL OF COMPUTER STUDIES

JAC444

Submission date:07-08-2022

Date:30-07-2022

o Should state your Full name and Id on the top of the file and save the file with your last name and id, like Ali_123456.txt

- Submission of working code. **(30%)**
- Make sure you follow the “Code Submission Criteria” mentioned above.
- You should zip your whole working project to a file named after your Last Name followed by the first 3 digits of your student ID. For example, **Ali123.zip**. If the zip file is too large to upload on BB , you can upload the video portion on Jac444-NBB team under files/workshop submission/w01
- Your marks will be deducted according to what is missing from the above-mentioned submission details.
- Late submissions would result in additional 10% penalties for each day or part of it.
- Remember that you are encouraged to talk to each other, to the instructor, or to anyone else about any of the assignments, but the final solution may not be copied from any source.

Academic Policies:

Most of the materials posted in this course are protected by copyright. It is a violation of Canada's Copyright Act and [Seneca's Copyright Policy](#) to share, post, and/or upload course material in part or in whole without the permission of the copyright owner. This includes posting materials to third-party file-sharing sites such as assignment-sharing or homework help sites. Course material includes teaching material, assignment questions, tests, and presentations created by faculty, other members of the Seneca community, or other copyright owners.

It is also prohibited to reproduce or post to a third-party commercial website work that is either your own work or the work of someone else, including (but not limited to) assignments, tests, exams, group work projects, etc. This explicit or implied intent to help others may constitute a violation of [Seneca's Academic Integrity Policy](#) and potentially involve such violations as cheating, plagiarism, contract cheating, etc.

These prohibitions remain in effect both during a student's enrollment at the college as well as withdrawal or graduation from Seneca.

Seneca College

Applied Arts & Technology
SCHOOL OF COMPUTER STUDIES

JAC444

Submission date:07-08-2022

Date:30-07-2022

Description:

The following workshop lets you practice basic java coding techniques, creating classes, methods, using arrays, Java I/O, inheritance, polymorphism, Exceptional Handling, JavaFx (GUI), Inner and Anonymous Classes, Lamda Expression, Java Collection Frame.

Task 1

In this task you will be experiencing on how to perform matrix addition concurrently

- Suppose you have multiple processors, so you can speed up the matrix addition.
- You must implement the following method in parallel.

public static double[][] parallelAddMatrix(double[][] a, double[][] b)

- Write a test program that measures the execution time for adding two 2,000 * 2,000 matrices using the parallel method (by running the multiple threads).

Hint: For parallel addition divide your matrix in to 6 matrices for example the size of 3000 * 3000 can be divided into [0][500], [501][1000],[1001][1500],[1501][2000],[2001][2500],[2501][3000] then run the addition of all in 6 different threads and at the end join the threads to finish the process one after another and calculate the time of all the threads.

You can use the examples from the slides on how to calculate time for threads (week 11 lecture slides). Remember to start clock right before you start the thread.

Note: Students are supposed to design their own output for the task

Task 2

Consider three classes StoreNumber, Counter, and PrintNumber. The StoreNumber class has integer data which is used by the Counter class to store value. The Counter is a thread class and counts from 0 to range and stores each value in StoreNumber. The PrintNumber class is another thread that keeps reading the value in the StoreNumber class and printing it.

Write a program that creates an instance of the StoreNumber class and sets up a Counter and a PrintNumber object to operate on it. The program must ensure that each number is printed exactly once, by adding suitable synchronization. Provide in reflection why it was needed to have synchronization added and which type is suited.