SUNWAY UNIVERSITY

CSC2103: Data Structures and Algorithms

Assignment - Total marks 20 Due: Week 13

The assignment aims to achieve the learning outcome [3] of this subject. You are required to implement a group project with appropriate data structures and algorithms for real-world problems. This assignment contributes 20% of your final grade. You are allowed to work in a group of 3 students maximum (Two students are ideal). All the submissions through e-learn, You can also work individually on this assignment.

Assignment requirements

Each group needs to use appropriate data structures and algorithms to implement a visualization or simulation for any TWO (2) problems listed in the following section (Problems List). You are encouraged to use Java programming language for the implementation; however, you are allowed to choose the programming language of your choice. The marks will be based on the use of appropriate data structures, general (support multiple data types), the accuracy of algorithms, and support the essential operations involved in it. For example, if you choose to implement a simulation for a Red-Black tree, it should support the insert (add node) and delete (remove node) operations.

Problems List

- Shortest pathfinding
- Hashing
- Binary Search Tree
- Red-Black Tree
- Huffman coding
- String matching (except naïve)
- Dijkstra algorithm

Documentation

Each group needs to submit a softcopy of the documentation (report) with the following section.

- Table of contents
- Introduction- Overview of the problem chose, choice of data structures, tools, programming language features used
- Problem 1 Implementation – detailed explanation of the implementations, diagrams, screenshots, limitations, etc.

- Problem 2 implementation - detailed explanation of the implementations, diagrams, screenshots, limitations, etc.
- Individual member contribution – role in the assignment, initiatives, cooperation
- Challenges – problems faced, how you managed to solve the issues
- Conclusion
- References

Note

Submitting the coursework means you have agreed that your work is original and comply with the rules and regulations (refer to Academic Impropriety). All the work needs to be submitted through Turnitin for plagiarism.

Marking Scheme

The marking depends on the implementation of the solutions, such as how generic the solution, accuracy, use of data structures, appropriate algorithm, and documentation. Each problem carries ten (10) marks.

Submission

The deadline for this assignment is on Week 13. This assignment should be submitted as a softcopy and at e-learn only.