

XYZ Logistics!

CS210 – Data Structures (232) Project 2 Weight (5%) Due: May 19, 2024(23:55)

Imagine a sprawling network of warehouses, distribution centers, and delivery hubs interconnected through a sophisticated system of cloud servers and edge devices. Every day, thousands of orders flood into XYZ Logistics' online platform, each requiring swift processing and delivery to customers spread across the city. Processing requests and delivering items at the earliest with the least possible cost is essential for maximizing company productivity, resulting in higher profits.

Conceptually, the XYZ Logistics servers can be depicted as graphs, with nodes representing servers/devices and edges denoting connections between them. Many scheduling problems in distributed, concurrent and parallel systems are NP-hard problems, meaning that finding optimal solutions may require exponential time complexity. Approximation algorithms and heuristics are often used to find near-optimal solutions for scheduling problems within reasonable time limits.

You oversee the extensive distributed computing infrastructure at XYZ Logistics, a complex network comprising numerous cloud servers and edge devices interconnected through a network. Each server or device is constrained by its processing capacity, necessitating optimal task allocation to minimize processing time. The company owners have invested millions into their data-centers. They are concerned about the longevity of the servers life and have restricted you to avoid burdening the servers. XYZ Logistics Owners want you to adhere to guidelines to find out an optimal solution.

You would need to use Dijkstra Algorithm for finding shortest path to complete this project.

Evaluation:

You are allowed to work as a group with maximum 2 members in a group. Your work's evaluation would be based the following criterion.

Step 1: Hackerrank You have unlimited chances to submit your code to hackerrank before the deadline. When you submit your code, the hackerrank platform tests your program against pre-built (hidden) testcases and grades your work. You need to fix all the mistakes in the project and try to earn a full score. For this project, there are no limitations on CPU time and memory usage. Upload your work to <https://www.hackerrank.com/232cs210p2>

Step 2: Upload your submission to LMS. The submission will consist of

- A zip file containing “ALL code”

- A jar file exported from Netbeans
- Upload the [coversheet](#) with personal details and a screenshot from Hackerrank.

The instructor reserves the right to determine the scores of each test case. Test-cases will be posted on hackerrank, students will have unlimited number of opportunities to post and test their project until the due date. The system will not take any submissions after the due date

Code Inspection and plagiarism:

The code would be inspected by the instructor. The instructor would use the MOSS tool (<https://theory.stanford.edu/~aiken/moss/>) to determine the originality of submission.

If the code similarity is above 50%, the students would earn ZERO score on the project. This includes **all** group members for all teams involved as well (i.e. all other groups with similar code)

Submission Dead-Line: The submission deadline is final. Late Submissions will be awarded ZERO points.

Important Notes:

- It is the student's responsibility to check/test/verify/debug the code before submission.
- It is the student's responsibility to check/test/verify all submitted work (including jar files)
- It is the student's responsibility to verify that all files have been uploaded to the LMS.
- Incomplete or wrong file types that do not execute will NOT be graded.
- For each project, instructor will provide a few sample test-cases to verify the execution of your program.
- After an assignment/project has been graded, re-submission with an intention to improve an assignments score will not be allowed.
- After the assignment/project has been graded, the instructor will post test-cases used for grading on the website.
- The instructor has the right to share project execution reports that may have been autogenerated on the course website.