

**CST232 – Operating Systems**

**Semester 1, Academic Year 2023/2024**

Assignment 2

**Students’ declaration:**

We declare that we understand what is meant by plagiarism. This assignment is all our own work and we have acknowledged any use of the published or unpublished works of other people. We hold a copy of this assignment. We can produce if the original is lost or damaged.

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| **Student Name** | **Signature** |
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Lecturer has, and may exercise, the right NOT TO MARK this assignment if the above declaration has NOT BEEN SIGNED and if the above declaration is FOUND TO BE FALSE, appropriate action will be taken which would lead to ZERO marks being awarded for this assignment

This **GROUP** assignment shall contribute **15%** of the overall evaluation. For this assignment, each group is required to complete the following tasks in THREE (3) weeks.

**Assignment instructions/background**

In the world of computers, smooth operation relies heavily on efficient management of data access. This is where disk scheduling comes in, playing a vital role in ensuring the optimal performance of your system. Disk scheduling, handled by the operating system, involves organizing and prioritizing requests for data transfer to and from the disk drive. Operating systems employ various disk scheduling algorithms to achieve optimal performance. Some of the most common ones include **FCFS (First Come First Served), SSTF (Shortest Seek Time First), SCAN, C-SCAN (Circular SCAN), C-LOOK (Circular LOOK) and FSCAN.**

**Task:**

Given a disk drive with 200 cylinders and a current head position at cylinder 50, your project aims to optimize its performance by comparing the SCAN, C-SCAN, and C-LOOK disk scheduling algorithms for a set of requests. You will need to implement these algorithms by using any programming language and analyse their performance to determine the optimal scheduling strategy. Run each algorithm with a set of 10, 20, 50, and 100 random requests.

Write a report with the following criterion;

1. Introduction about SCAN, C-SCAN, and C-LOOK disk scheduling algorithms.
2. Present the average and worst-case seek times for each algorithm and request size.
3. Analyse the results and discuss the strengths and weaknesses of each algorithm.
4. Provide a recommendation for choosing the best algorithm depending on the specific situation.
5. Include the source code of your implemented algorithms and any additional data or graphs in the appendix. You may use any programming language.

**Requirements:**

**Online Submission**

* Upload the assignment to eLearning portal. Only one submission per group is required. The submission due date is **11th January 2024** (latest by 11.59 PM).

**Report Format**

* The FORMAT of the assignment should be Font Name/Size: Times New Roman, 12pt; Line spacing of 1.5; Justified (Alignment); Page Number should be typed.

**Important Note**

* Plagiarism is not tolerated. Materials taken directly from internet or other sources is not acceptable. You must show this is your own work, created using your own effort. For late submission, marks shall be deducted accordingly.

**Group:** Same group as tutorial (1-4 persons). Everyone in the group must contribute.

**Contribution**: 15% of coursework.

**Due date:** 11th January 2024 (11.59pm)

**Grading Rubric**

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| **Criteria** | **Poor**  **(0-3 marks)** | **Average**  **(4-5marks)** | **Good**  **(6-7 marks)** | **Excellent**  **(8-10 marks)** |
| **Correctness and completeness of the implementation of the algorithms. (10 marks)** |  |  |  |  |
| **Accuracy and clarity of the results and analysis. (10 marks)** |  |  |  |  |
| **Organization and presentation of the report. (10 marks)** |  |  |  |  |
| **Total (/30)** |  |  |  |  |
| **Total (/100)** |  |  |  |  |