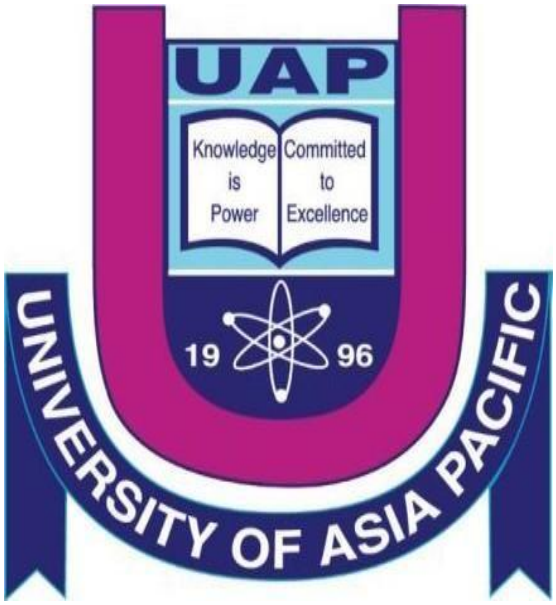

Department of Computer Science & Engineering

Course Title: Operating System Lab

Course Code: CSE 406

Lab Report No: 07

Lab Report: SSTF Disk Scheduling

Submitted To:

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Problem Statement:

To implement the SSTF (Shortest Seek Time First) disk scheduling algorithm and calculate the total seek time based on a given set of disk requests and an initial head position.

Steps:

- Input the disk request queue and initial head position.
- At each step, choose the request closest to the current head.
- Move the head to that request and calculate the seek time.
- Repeat until all requests are serviced.
- Output the sequence and total seek time.

Code:

sstf_disk_scheduling.py > sstf

```python
def sstf(requests, head):
    requests = requests[:]
    sequence = []
    total_seek = 0
    current = head

    while requests:
        closest = min(requests, key=lambda x: abs(x - current))
        sequence.append(closest)
        total_seek += abs(current - closest)
        current = closest
        requests.remove(closest)

    print("SSTF Disk Scheduling:")
    print("Sequence:", [head] + sequence)
    print("Total Seek Time:", total_seek)

requests = [0, 14, 41, 53, 65, 67, 98, 122, 124, 183, 199]
head = 53

sstf(requests, head)

```

Output:

```
[Running] python -u "d:\Operating-System\sstf_disk_scheduling.py"
SSTF Disk Scheduling:
Sequence: [53, 53, 41, 65, 67, 98, 122, 124, 183, 199, 14, 0]
Total Seek Time: 369

[Done] exited with code=0 in 0.044 seconds
```

Discussion:

SSTF selects the request with the shortest distance from the current head position, reducing total seek time. However, it may cause starvation for faraway requests if closer ones keep arriving.

Input:

Request Sequence: [0, 14, 41, 53, 65, 67, 98, 122, 124, 183, 199]

Initial Head: 53

Output:

Seek Sequence: [53, 41, 65, 67, 98, 122, 124, 183, 199, 14, 0]

Total Seek Time: 369

Conclusion:

SSTF reduces the average seek time but may not be optimal for all workloads due to potential starvation issues.

Git Link: https://github.com/Amirul-Islam-Papon/Operating-System/blob/main/sstf_disk_scheduling.py