Advanced Operating Systems
Project-3 Group 2

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Disk Scheduling Algorithms

Consider a disk drive with 5000 cylinders, numbered from 0 to 4999. The current head position is at cylinder 2255, and the previous head position was at cylinder 1723. The queue of pending requests, in FIFO order, is:

2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692.

For each disk scheduling algorithm listed below, starting from the current head position, we will calculate the order of cylinders visited by the head and the total distance (in cylinders) the disk arm moves to satisfy all pending requests.

1. FCFS (First Come First Serve)

- Request Queue: 2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position:2255

- Order of Visit: 2255 → 2055 → 1175 → 2304 → 2700 → 513 → 1680 → 256 → 1401 → 4922 → 3692

- Total Distance Calculation:

 |2255 - 2055| + |2055 - 1175| + |1175 - 2304| + |2304 - 2700| + |2700 - 513| + |513 - 1680| + |1680 - 256| + |256 - 1401| + |1401 - 4922| + |4922 - 3692|

 = 13279 cylinders

2. SSTF (Shortest Seek Time First)

- Request Queue based on FIFO:2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position:2255

- Order of Visit:2255 → 2304 → 2055 → 1680 → 1401 → 1175 → 513 → 256 → 2700 → 3692 → 4922

- Total Distance Calculation:

 |2255 - 2304| + |2304 - 2055| + |2055 - 1680| + |1680 - 1401| + |1401 - 1175| + |1175 - 513| + |513 - 256| + |256 - 2700| + |2700 - 3692| + |3692 - 4922|

 = 6763 cylinders

3. SCAN (Elevator Algorithm)

- Request Queue: 2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position:2255

- Order of Service:

 2255 → 2304 → 2700 → 3692 → 4922 → 4999 → 2055 → 1680 → 1401 → 1175 → 513 → 256

- Total Distance Calculation:

 |2255 - 2304| + |2304 - 2700| + |2700 - 3692| + |3692 - 4922| + |4922 - 4999| + |4999 - 2055| + |2055 - 1680| + |1680 - 1401| + |1401 - 1175| + |1175 - 513| + |513 - 256|

 = 7487 cylinders

4. LOOK

- Request Queue: 2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position: 2255

- Order of Service:

 2255 → 2304 → 2700 → 3692 → 4922 → 2055 → 1680 → 1401 → 1175 → 513 → 256

- Total Distance Calculation:

|2255 - 2304| + |2304 - 2700| + |2700 - 3692| + |3692 - 4922| + |4922 - 2055| + |2055 - 1680| + |1680 - 1401| + |1401 - 1175| + |1175 - 513| + |513 - 256|

= 7333 cylinders

5. C-SCAN

- Request Queue: 2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position: 2255

- Order of Service:

  2255 → 2304 → 2700 → 3692 → 4922 → 4999 → 0 → 256 → 513 → 1175 → 1401 → 1680 → 2055

- Total Distance Calculation:

  |2255 - 2304| + |2304 - 2700| + |2700 - 3692| + |3692 - 4922| + |4922 - 4999| + |4999 - 0| + |0 - 256| + |256 - 513| + |513 - 1175| + |1175 - 1401| + |1401 - 1680| + |1680 - 2055|

  = 9798 cylinders

6. C-LOOK

- Request Queue: 2055, 1175, 2304, 2700, 513, 1680, 256, 1401, 4922, 3692

- Initial Head Position: 2255

- Order of Service:

  2255 → 2304 → 2700 → 3692 → 4922 → 256 → 513 → 1175 → 1401 → 1680 → 2055

- Total Distance Calculation:

  |2255 - 2304| + |2304 - 2700| + |2700 - 3692| + |3692 - 4922| + |4922 - 256| + |256 - 513| + |513 - 1175| + |1175 - 1401| + |1401 - 1680| + |1680 - 2055|

  = 9132 cylinders