Assignment 10

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Q1

(1)

READ/WRITE data time = (1) **Seek time** + (2) **Rotational latency** + (3) **Transfer time**.

(2)

a)

FIFO: 70, 30, 90, 120, 60, 20

SSTF: 90, 70, 60, 30, 20, 120

SCAN: 120, 90, 70, 60, 30, 20

CSCAN: 120, 20, 30, 60, 70, 90

b)

Seek Time:

FIFO:

[(100-70) + (70-30) + (90-30) + (120-90) + (120-60) + (60-20)]*1ms = 260ms

SSTF:

[(100-90) + (90-70) + (70-60) + (60-30) + (30-20) + (120-20)]*1ms = 180ms

SCAN:

[(120-100) + (199-120) + (199-90) + (90-70) + (70-60) + (60-30) + (30-20)]*1ms = 278ms

CSCAN:

[(120-100) + (199-120) + (199-0) + (20-0) + (30-20) + (60-30) + (70-60) + (90-70)]*1ms = 388ms

Rotational latency:

Since randomly distributed sector is read for each track in the request queue, and

rotation rotation speed be 12000r/min = 200r/s => 5ms/r

Therefore every request need 0.5*5ms = 2.5ms

Since there're 6 requests for each algorithm, the rotation latency is 2.5*6=15ms.

There's no information on transfer time, so we neglect it.

Total Time

FIFO: 260+15=**275ms**

SSTF: 180+15=**195ms**

SCAN: 278+15=**293ms**

CSCAN: 388+15=**403ms**