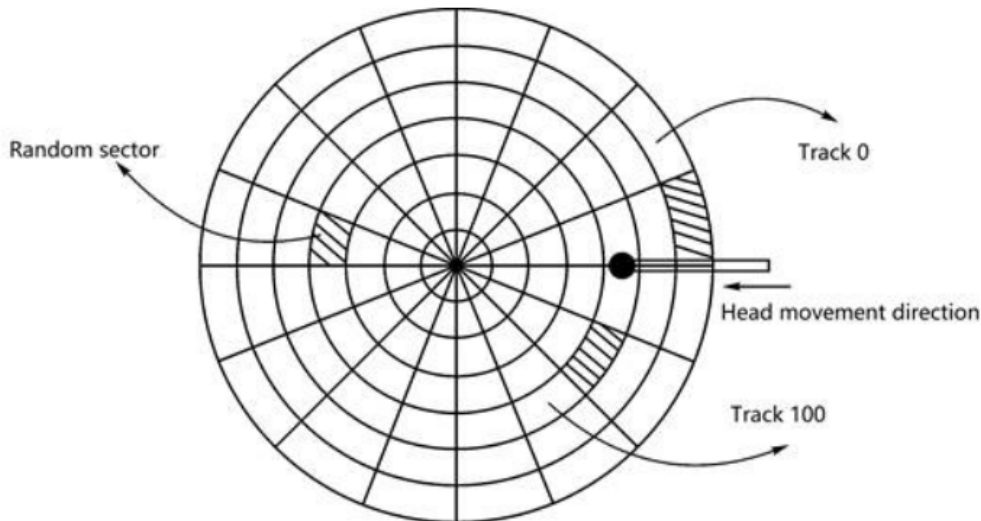


# Assignment 10

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## Q1

Suppose the computer system uses the disk as the following:



The disk has **200 tracks** in total. Let a single-sided disk rotation speed be **12000r/min per minute**, each track has **100 sectors**, and the average **movement time between adjacent tracks is 1 ms**. If at some point, the head is located at track 100 and moves in the direction in which the track number increases, the track number request queue is 70, 30, 90, 120, 60, 20. A randomly distributed sector is read for each track in the request queue.

(1) READ/WRITE data time = (1)Seek time + (2)Rotational Latency + (3)Transfer Time. [20 pts]

(2) Use FIFO\SSTF\SCAN\CSCAN algorithm to read the six sectors, [80pts]

- a) write the track access sequence
- b) how much time is required in total? The total calculation process is required

a)

Algorithm	Access Sequence
FIFO	100 70 30 90 120 60 20
SSTF	100 90 70 60 30 20 120
SCAN	100 120 90 70 60 30 20
CSCAN	100 120 20 30 60 70 90

b)

$$12000\text{rev/min} = 60000 / 12000 = 5\text{ms/rev}$$

average rotation delay = 2.5ms

suppose the transfer time =  $t$

- FIFO:  $(30 + 40 + 60 + 30 + 60 + 40) + 2.5 \times 6 + t = 275 + t$  ms
- SSTF:  $(10 + 20 + 10 + 30 + 10 + 100) + 2.5 \times 6 + t = 195 + t$  ms
- SCAN:  
 $(20 + 79 + 109 + 20 + 10 + 30 + 10) + 2.5 \times 6 + t = 293 + t$  ms
- CSCAN:  
 $(20 + 79 + 199 + 20 + 10 + 30 + 10 + 20) + 2.5 \times 6 + t = 403 + t$  ms