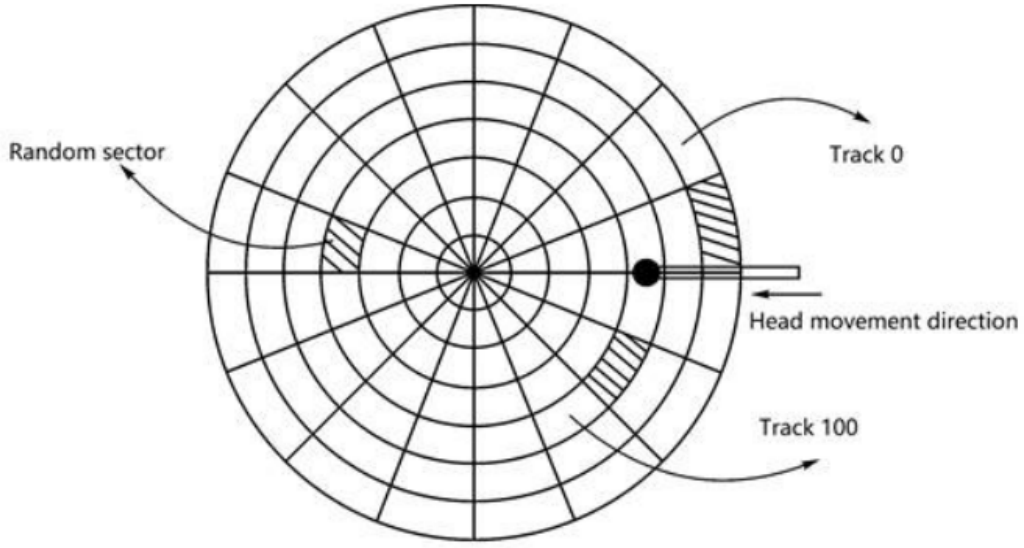
Assignment10

1. Disk scheduling [100 pts]

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) _____ + (2) _____ + (3) _____. [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 calculation process is required.

A: (1) Seek Time, Rotational Latency, Transfer Time

(2) FIFO: 70, 30, 90, 120 ,60 ,20

totoal time =

$(100-70+70-30+90-30+120-90+120-60+60-20)\times 1+\frac{1}{2}\times(60000/12000)\times 6=275$ ms.

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

totoal time =

$(100-90+90-70+70-60+60-30+30-20+120-20)\times 1+\frac{1}{2}\times(60000/12000)\times 6=195$ ms.

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

total time =

$(120-100+199-120+199-90+90-70+70-60+60-30+30-20)\times 1+\frac{1}{2}\times(60000/12000)\times 6=293$ ms.

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

total time =

$(120-100+199-120+199+20+30-20+60-30+70-60+90-70)\times 1+\frac{1}{2}\times(60000/12000)\times 6=403$ ms.