Homework 7: Disk Scheduling

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Due date: noon of Thursday Apr 21, 2022

[Question 1] Briefly, explain Thrashing in page replacement.

Thrashing is ff a process does not have “enough” pages, the page-fault rate is very high. This happens where there is a page fault to get the page, the existing frame is replaced, but then the frame that was replaced is needed back quickly. This leads to low CPU utilization, the operating system thinking that it needs to increase the degree of multiprogramming, and nother process is added to the system

[Question 2] What is the advantage of segmentation memory management scheme?

The main advantage is that I reduces page faults

[Question 3] Given the following equation and table:
Average I/O time = average access time + (transfer amount / transfer rate) + controller overhead

What is the average I/O time to transfer 4MB block on a 4200 RPM disk with a 2ms average seek time, 1Gb/sec transfer rate with a .01ms controller overhead?

Spindle [rpm]	Average latency [ms]
4200	7.14
5400	5.56
7200	4.17
10000	3
15000	2

Average_access_time = 2 ms + 7.14 ms = 9.14 ms

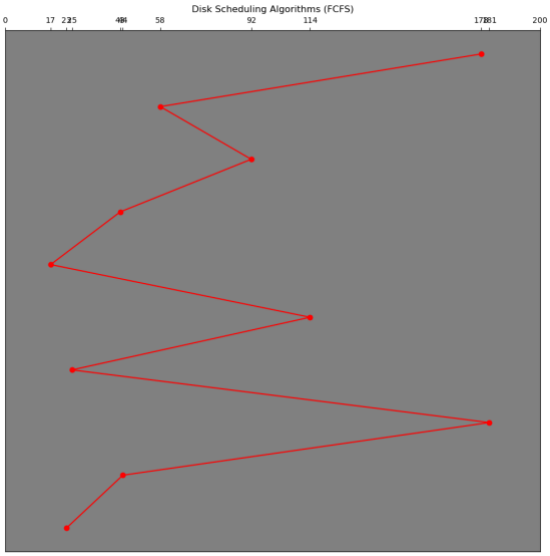
9.14 + 4 + 0.01 = 13.15 ms = Average I/O time

[Question 4] Compare the following:

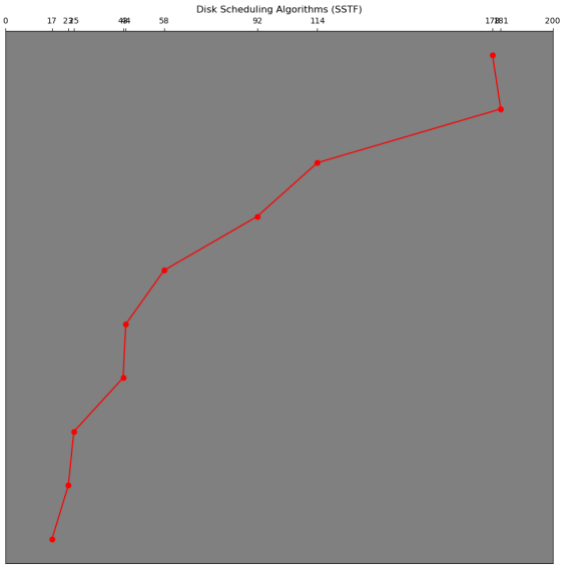
	cost	**speed**	**size**
Magnetic disk drive	mid	mid	30GB to 3TB
Solid state drive	high	high	30GB to 3TB
Magnetic tape	low	low	200GB to 1.5TB

[Question 5] For the following request queue: [178, 58, 92, 43, 17, 114, 25, 181, 44, 23] Requests range from 0 to 200. Show illustrations of applying the following disk scheduling algorithms:

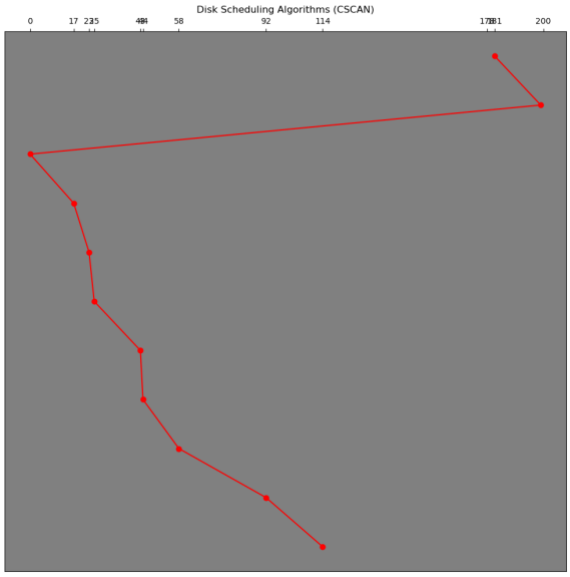
1. FCFS



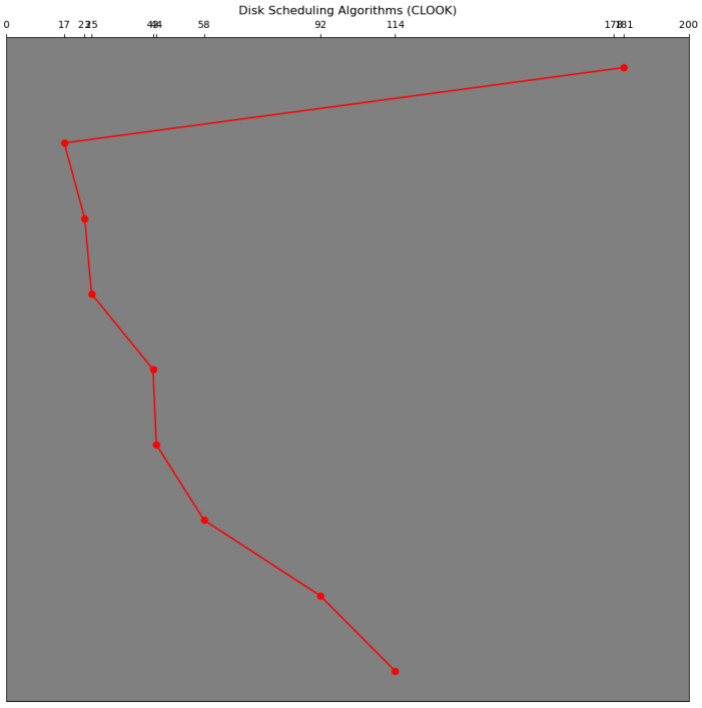
2. SSTF



3. C-SCAN



4. C-LOOK



[Submission]

Add your document to the *homeworks* directory in your shared folder on Drive.