

1. 2016-1a

Circle or cross: "T" if True – "F" if False.

- T / F** A file is logical storage unit (Silber9).
- T / F** A volume (of file system) may be a subset of a device, or a whole device, or multiple devices linked together into a disk array set (Silber9).
- T / F** Microsoft Windows' volume label "C:" is usually reserved for the main disk. Label "A:" and "B:" were once reserved for the floppy disks.
- T / F** The implementation of File Systems on Virtual Machines is called Virtual File Systems (VFS (Silber9).
- T / F** One disadvantage of linked allocation method (of disk space) is external fragmentation (Silber9).
- T / F** A unified buffer cache can not solve the problem of double caching (Silber9).

2. 2016-1b

Diketahui sebuah disk dengan 100 silinder (0 - 99) menggunakan algoritma penjadwalan C-LOOK dengan antrian (queue) terpisah untuk "menulis" (W) dan "membaca" (R) sebagai berikut:

- antrian "R":
selama tidak kosong, hanya antrian ini yang akan dilayani (kecuali jumlah W tertentu).
- antrian "W":
hanya dilayani, jika antrian R kosong. Kecuali:
- antrian "W" menumpuk lebih dari 10:
maka antrian R harus menunggu hingga satu siklus C-LOOK penuh.
- UP:
Untuk pergerakan antar silinder (UP), diperlukan 1 unit waktu.
- RETURN, RtoW, WtoR:
Untuk balik (return), switch dari R ke W atau dari W ke R, diperlukan 5 unit waktu.
- Sekali heads bergerak, permintaan baru tidak akan mengubah tujuan dari heads (hingga heads sampai tujuan).
- Saat $T=0$, posisi heads pada silinder 0.
- Abaikan "rotational latency".

Permintaan akses sebagai berikut:

Time(t)	000	020	040	060	080	100	120	140	160	180	200
R	50	20	40	60	80	-	50	-	-	-	-
W	-	-	-	-	20	-	-	-	-	-	-

Lengkapi table berikut (tersedia 2 baris contoh pengisian):

Silinder	Time	R-QUEUE	W-QUEUE	QUEUE	NEXT
00	000	50	-	R-QUEUE	UP
50	050	20:40	-	R-QUEUE	RETURN
Waktu Total					

3. 2016-2

Consider 24 disks (@ 1TB) in a RAID 6+1 formation: D01, D02, D03, D04,.... D23, D24.

- Draw the RAID 6+1 diagram! Do not forget to give proper labels to show the RAID6/RAID1 parts.
- What is that storage capacity (TB) of the RAID 6+1 above?
- What is the Read speed up?
- What is the Write speed up?

4. 2017-1

Circle or cross: "T" if True – "F" if False.

- T / F** There is no external fragmentation in a file system with linked allocation.
- T / F** The Deadline I/O Scheduler (Linux) gives the **Read Queues** a higher priority.
- T / F** In a distributed file system, it is possible to write unnoticed by others for a short time.
- T / F** Doubling the block size in a indexed allocation disk space system will exactly double the maximum file size.

DISCLAIMER: These following are logical (not physical) numbers! Consider a disk with 10000 cylinders (cyl. 0 to 9999) and 2 surfaces. Each track has 100000 sectors. Each sector size is 1000 bytes. The spin rate is 6000 RPM (Revolutions Per Minute). A seek takes 1 milliseconds per cylinder moved. The initial disk head position is at cylinder 0. Assume that 1 GBytes = 1000 Mbytes = 1000000 KBytes = 1000000000 Bytes.

- T / F** The spin rate 6000 RPM is known in SI (Systeme Internationale) as 100 Hz.
- T / F** Each full disk rotation will take 10 ms.
- T / F** There will be 100 Mbytes data in each track.
- T / F** The maximum theoretical transfer rate will be 100 Mbytes/10 ms = 10 GBytes/ second.
- T / F** Each surfaces of that disk will have 5000 tracks.
- T / F** The total disk capacity will be 10000 GBytes.