1) 1-8

F, D, C, B, G, J, H, I

2) 1-14

F, T, T, F, T, F, T, T, F, F, T, F, T, T

3)

| A | B | A | B |

0 4 8 12 14

The response time job B is 1 ms

4)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 7 | 2 | 1 | 5 | 2 | 5 | 7 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 |
|  | 7 | 7 | 1 | 1 | 1 | 1 | 1 |
|  |  | 2 | 2 | 2 | 2 | 2 | 2 |
| \* | \* | \* | \* |  |  |  | \* |

The number of page faults is 5

5)

In case both thread 1&2 run: ACB or CAB

In case only thread 1 run, thread 2 does not run: A

In case only thread 2 run, thread 1 does not run: C

6)

1. Get file permission and where bitmap of “os.txt” data

2. Access bitmap and find free blocks in bitmap

3. Calculate how many blocks need and change from 0→1 bits in free blocks that now became dirty block.

4. Write “char\_buffer” with “num\_bytes” bytes to os.txt blocks

5. Update new bitmap (size) in os.txt inode.

7)

Number of pointers/block = 16KB/8 = 2048

There are 12 direct pointers and 1 triple indirect pointer

The largest file can be stored is: 12\*16KB + 20483 \* 16KB

8)

- Access control list shows which subjects has permission on an object or which objects that a subject has permission

Advantages:

+ Only O(1) time complexity to know a subject has access on an object.

+ Only O(1) time complexity to add access for a new subject.

+ Only O(1) time complexity to delete access for a new subject.

+ Depend on implements (per-subject or per-object access control list), it spends short time for creating a new object to which all subjects by default have access (O(1) in case using per-object access control list)

Disadvantages:

+ Take time to get/delete accesses of object, O(n), n is subject number.

+ Depend on implements , it may take time to create a new object to which all subjects by default have access, O(n), n is subject number in case use per- subject access control list.

- Access control matrix shows two-dimensional array(one for subject and the other for object) of accesses

Advantages:

+ Only O(1) time complexity to get/delete accesses of object.

Disadvantages:

+ Big size

+ Take time to delete access subject, O(n), n is subject number.

9.

The distributed file system AFS uses callbacks to notify to clients when the shared files are modified (cached) in server.

An alternative approach is instead clients check with server, server uses callback to inform to clients.

- Advantages:

Clients do not check cached is valid in server cyclic.

Reduce number of client/server interactions.

- Disadvantages:

Clients assume cached files are valid until the server notifies them, maybe it’s out of sync