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Q.1. If the OS were to know that a certain application is going to access the file data in a sequential manner, how could it exploit this information to improve performance?

→ When the block is accessed, the file system could prefetch the subsequent blocks in anticipation of future requests to these blocks. This prefetching optimisation would reduce the waiting time experienced by the process for future requests.

Q.2. The open-file table is used to maintain a separate table for each user or just maintain one table that contains references to files that are being accessed by all users at the current time? If the same file is being accessed by two different programs or users, should there be separate entries in the open file table?

→ By keeping a central open-file table, the OS can perform the activity that would be infeasible otherwise. Consider a file is being accessed by at least one process. In the even that the file is erased, at that point it ought not be taken out from the disk until all processes accessing the file have closed it. This check could be performed just if there is centralised accounting of the number of processes accessing the file. Then again, in the event that two processes are accessing the file, at that point a separate state should be kept up to monitor the current location of which parts of the file are being accessed by the two processes. This requires the OS to keep up separate entries for the two processes.

Q.3. Discuss the situations under which the least frequently used page replacement algorithm generates fewer page faults than the least recently used page-replacem algorithm. Also, discuss under which circumstance the opposite holds.

→ Consider the following sequence of memory in system that can hold four pages in a memory: 112345 When the page '5' is accused, the LFU page replacement algorithm would replace a page other than 1, and therefore would not incre a page fault when page 1 is accused again. On the former hand, for the sequence '12345', the LRU algo perform