

Quiz 4

Kushagra Agarwal

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Q3) Consider a system implementing multi-queue scheduling.

a) ~~Can the problem be solved by the problem~~  
can be solved if programs could maximise their CPU time allocations by not fully utilizing its time quantum. It is allowed to use majority of the time quantum, as signed to it but should release the CPU before the end of the quantum. This will increase the priority of the process.

Q4) Discuss how the following parts of scheduling affect CPU utilization and response time:

i) CPU utilization and response time:  
CPU utilization gets increased if the overheads that come with context switching can be reduced. This can be done by performing these context switches infrequently but can negatively impact by ~~increasing~~ increasing the process's response time.

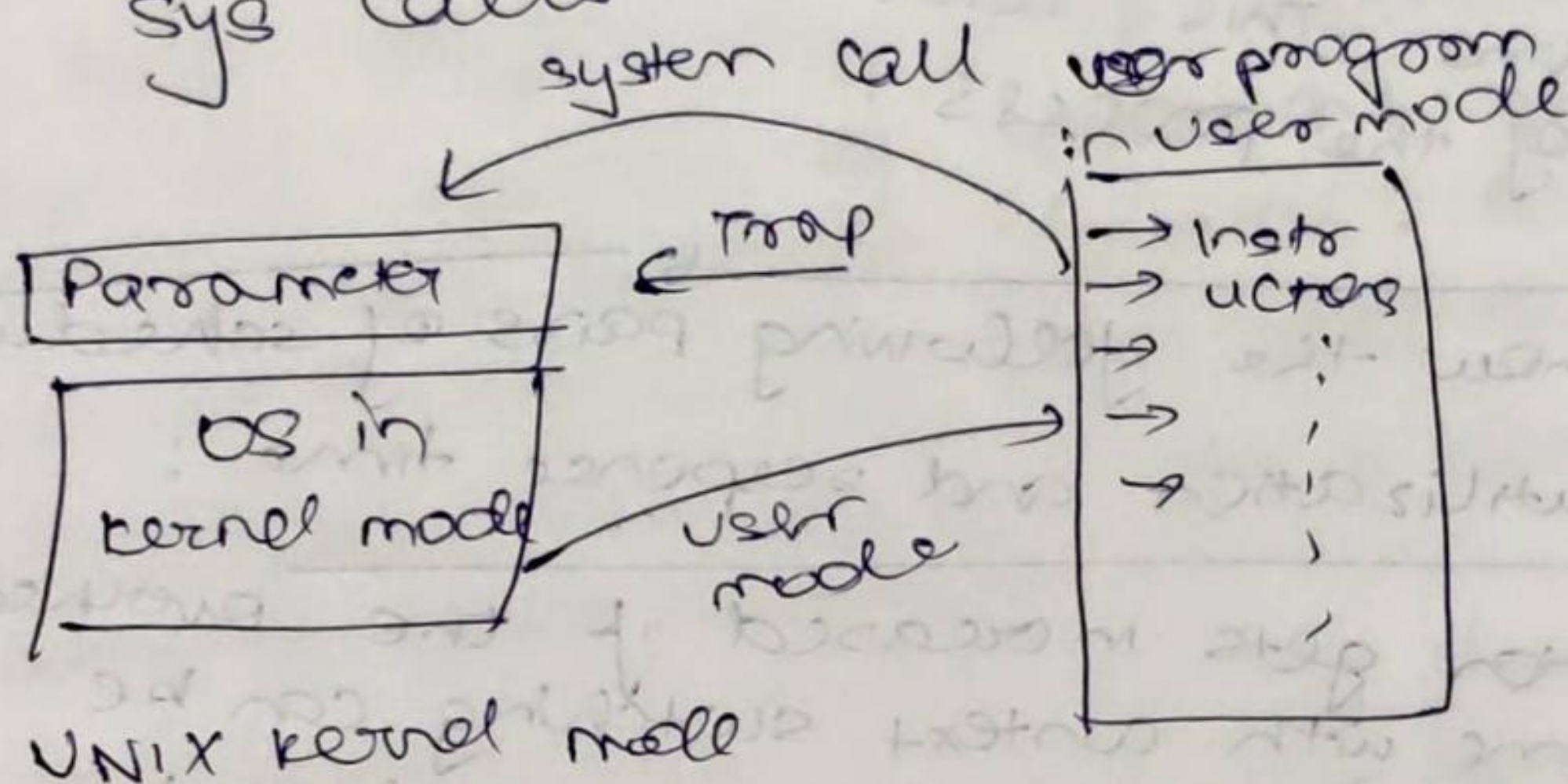
ii) I/O device utilization and CPU utilization:

We can maximize CPU utilization by running long CPU-bound tasks with no context switches. whereas I/O device utilization is maximised by scheduling these I/O jobs as soon as they are ready to run which ends up conflicting CPU utilization as it increases context switches.



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Q1) UNIX is unsuitable for real-time applications because a process

sol) As the process running in kernel mode may not get interrupted, it becomes impossible for the Operating system to respond rapidly to real-time requirements. Processes running under kernel mode cannot be preempted.  
∴ Disable all interrupts when processing sys calls.



Q2) A time sharing OS uses priority based scheduling for time-critical.

sol) i) Interactive processes → These interact constantly with the user and ∴ spend a lot of the time waiting for keypresses and mouse operations. When input is received, the process must be woken up quickly or the user will find the system to be unresponsive. Typically the average delay must be bounded or the user will believe that there is an error.

ii) Batch process → As they do not need much user interaction they tend to run in the background - Scheduler can finalize them as they need not have good response times.



ii) Time-Critical → They have very strong scheduling requirements and such should not be blocked by lower priority processes. They should have a very short response time and the response time should ~~be~~ have minimum variances. should be given highest priority.

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