



SECJ 4423:

REAL-TIME SOFTWARE ENGINEERING

SECTION / SEMESTER:

04 / SEMESTER II 2022-2023

PROBLEM SOLVING 5 PART 2

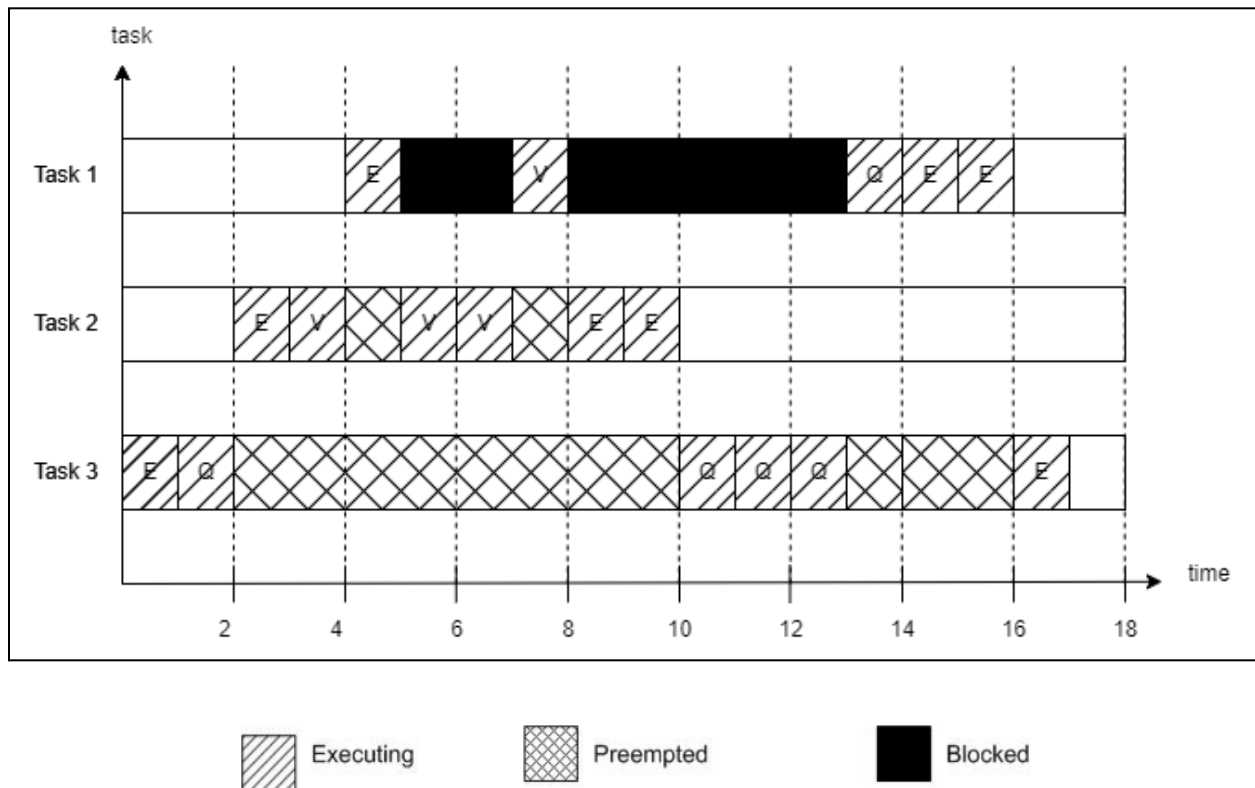
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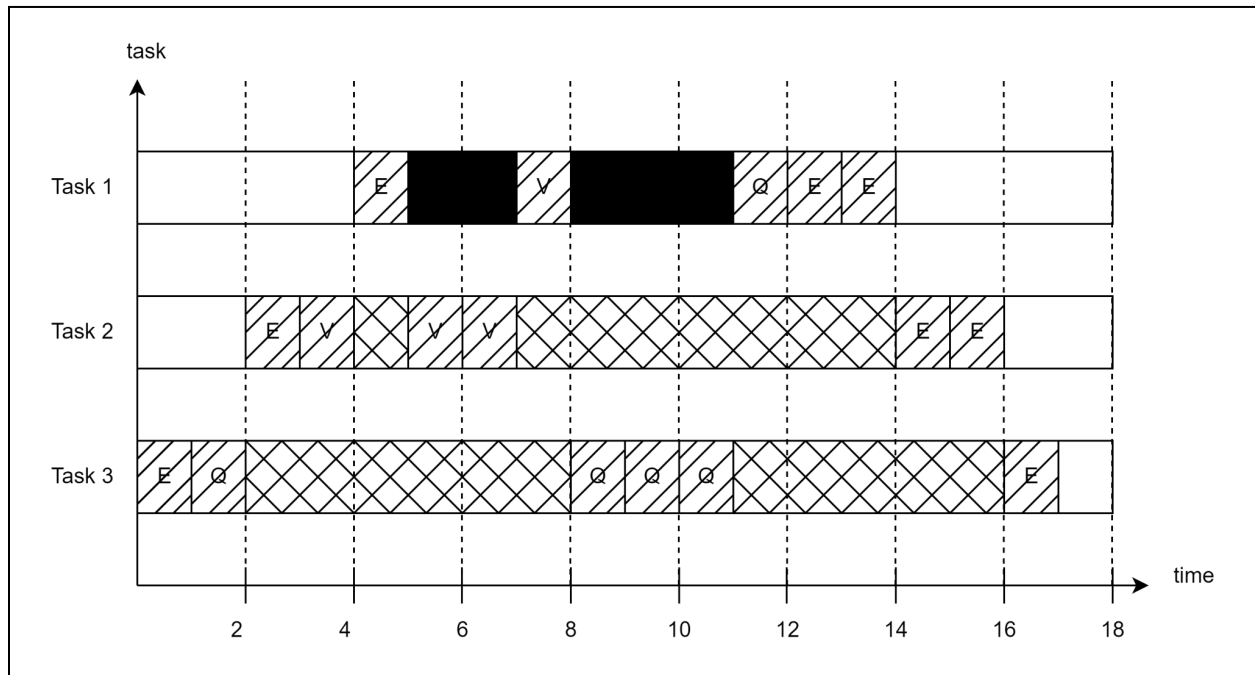
i.



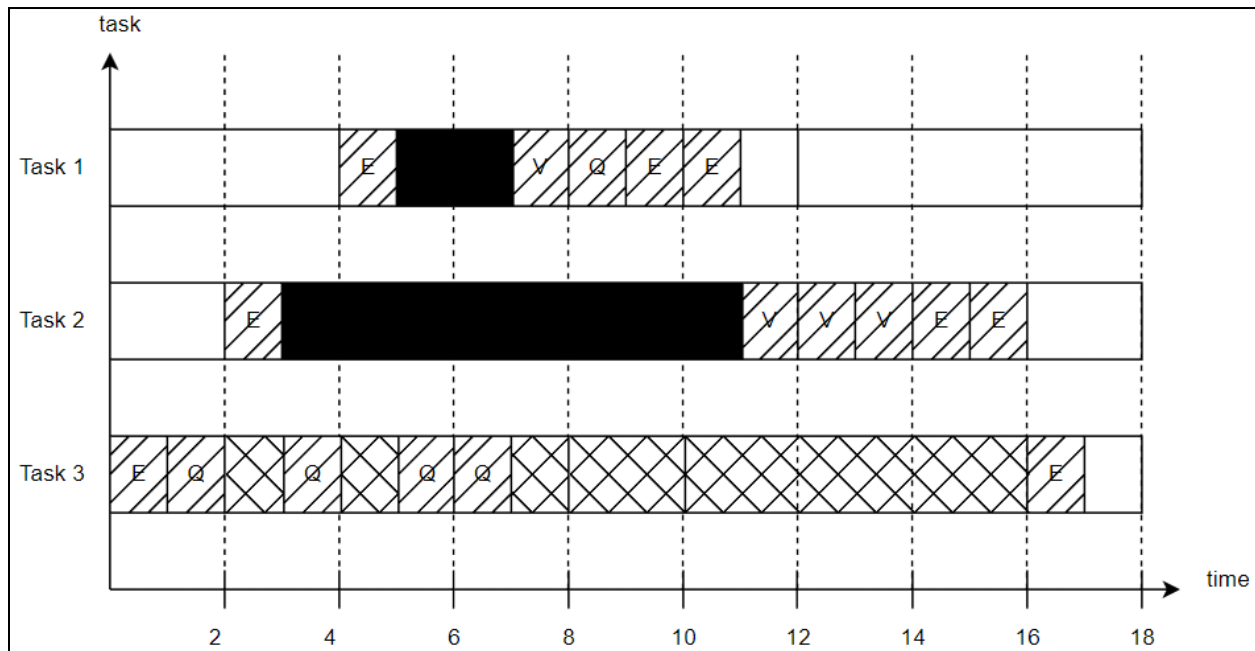
ii. Based on the sketch, priority inversion happens between task 1 and other tasks which lead to the inversion of the priorities between the higher and lower priorities tasks. This can be seen in the sketch where Task 1 is blocked two times from finishing the tasks as the resources are being used by Task 2 and Task 3 which makes lower priority tasks such as Task 2 and Task 3 to be executed first before Task 1.

iii.

Priority Inheritance Solution



Priority Ceiling Protocol Solution



Both solutions result in the finishing of tasks according to their respective priorities. The difference between the above solutions is that the priority inheritance and priority ceiling

protocol including Task 1 ends faster using the original priority ceiling protocol is implemented, within 11 milliseconds, compared to when priority inheritance is implemented, 14 milliseconds, which is longer than the priority ceiling protocol. This is due to how the task is prioritised according to each method.