3a. (20 **points) Priority Inversion and Priority inheritance**

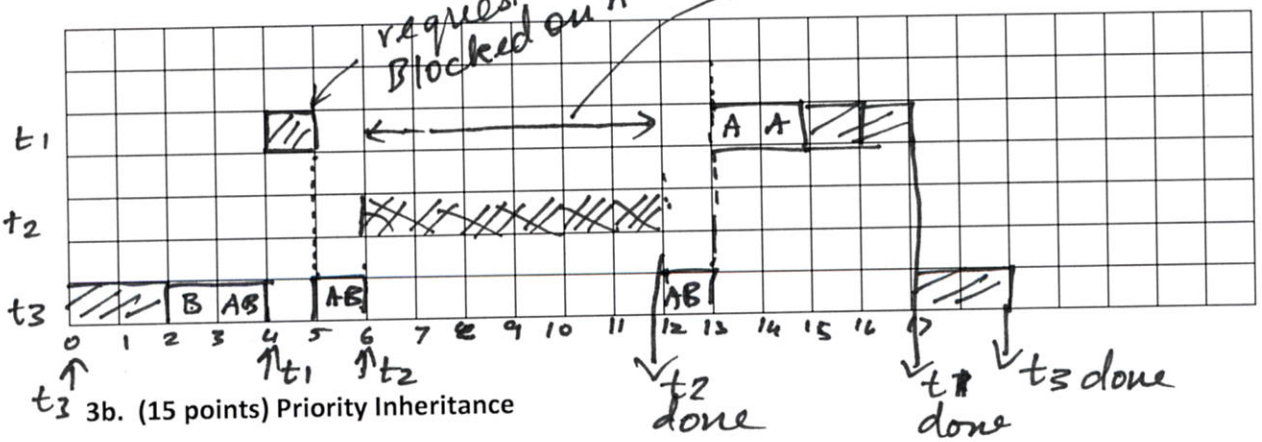
Three real-time tasks bus manager (t1: frequent: high priority), communication task (t2: medium priority) and meteorological task (t3: low priority) run on the NASA Mars Pathfinder. NASA has sent out an urgent request to solve a problem that PathFinder is frequently resetting spontaneously losing all the data. Can you diagnose the problem and solve the problem for NASA?

Assume that the tasks with their resource requirements as given below: {arrival time, execution time, priority, resource need}: **Explain important points using annotations on the chart.**

(a) t1: { 4, 5, 1:[A:2]} where the task executes for 1 time unit, then requests resource A for 2 time units, and then completes execution.
(b) t2: { 6, 6, 2:[none]} where the task executes for 6 times units and has no resource request.
(c) t3: { 0, 8, 3:[B:4[A:3]]} where the task executes for 2 units, then requests resource B, and after 1 time unit requests resource A for 3 times units (totally 4 time units of resource B), then completes execution.

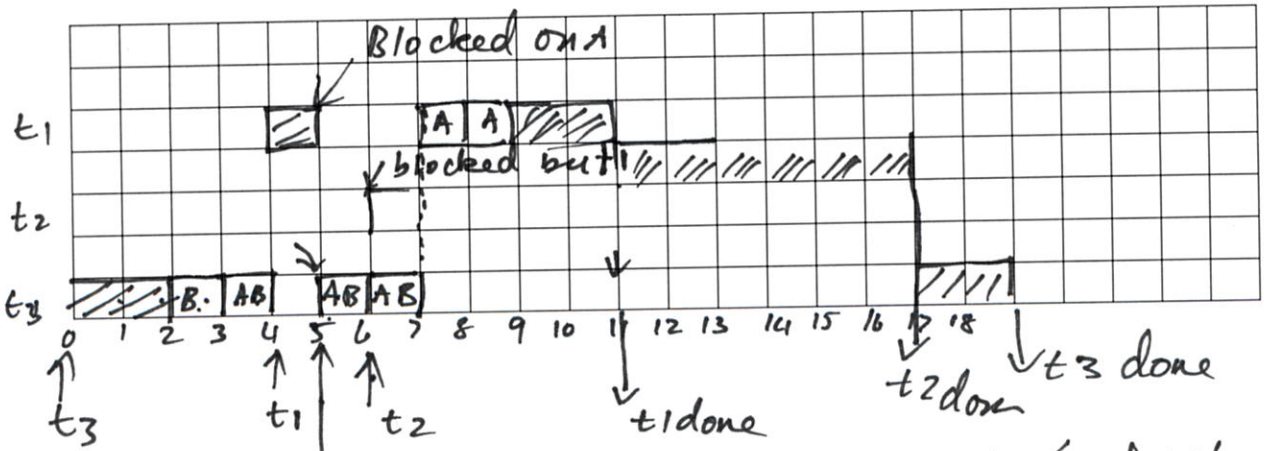
t1 >> t2 >> t3

Construct the schedule for the system using only simple priority policy and illustrate the occurrence of priority inversion.



3b. (15 points) Priority Inheritance

Construct the schedule for the system using priority inheritance and illustrate how it solves the priority inversion problem. **Explain important points using annotations on the chart.**



t3 temporarily inherits t1's higher priority

classnotes --/demos