Operating Systems Classwork 4 – Resource Allocation Page 1 of 3

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| **Resources** |
| 1. Identify 2 resources of a computer system that are shareable (can be used by more than one process at the same time)  Wi-Fi signal & speaker |
| 2. Identify 2 resources of a computer system that are not shareable ( can be used by only one process at a time)  Driver & a CPU thread |
| **Policies v Mechanisms** |
| 3. What is the **mechanism** for delivery of tea and coffee in the college restaurant?  Coffee is put in coffee machine, the coffee machine does its thing(magic) and |
| 4. What is the **policy** for delivery of tea and coffee in the college restaurant?  Do not heat the water above the required amount, do not use tea or coffee that is expired or contaminated. |

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| **Deadlock avoidance strategy**  A system has resources R1, R2 , R3, R4  Process A holds R1 and may eventually need R2 and R3.  Process B holds R2 and may eventually need R4.  Process C holds R3 and may eventually need R4  The current situation is represented in the following table:   |  |  |  | | --- | --- | --- | | Process | Holds currently | Possible Future Claims | | A | R1 | R2,R3 | | B | R2 | R4 | | C | R3 | R4 | | D | R4 | R1 | |
| 5. Is the system currently in a safe state? (Is there a sequence in which the processes could finish even if all of them need all their possible future resources?).  If yes show a sequence of process terminations that would be guaranteed possible.  If no show why not.  HINT: use the resource allocation graph  Yes, PC -> PB -> PA |
| **6.** For the problem from Question 5, a new process D arrives which needs R4 to get started and may eventually need R1.  Should process D be allowed to start (and therefore to acquire R4). Justify your answer.  No, as R4 is needed to start either C or B, they can be started in any order one after the other. Then A will run and release R1, which D would have needed to release R4 which was mentioned at the start. As D cannot acquire 1 until A finishes which requires C and B to finish which require 4 which would not be possible if D had it. |