Assignment No3 Solution

**CS 604**

For Any Solution Just Comment on Website

**CS604 Assignment No.3 2021**

1. Calculate the Need Matrix for each process (P0 to P4) from the information given in the

table.

**Solution**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Processes |  | Allocation | |  |  | Max | |  |  | Available | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Resource | R0 | R1 | R2 | R3 | R0 | R1 | R2 | R3 | R0 | R1 | R2 | R3 |
| Types |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| P0 | 3 | 1 | 1 | 0 | 5 | 2 | 1 | 0 | 2 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| P1 | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 | 2 | 1 | 0 | 0 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

1. Use the safety algorithm to find out that either the system is in a safe state or not. Write

down the complete available Matrix (work matrix).

**Solution**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Processes |  | Allocation | |  |  |  | Max | |  |  | Available | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Resource | R0 | R1 | R2 | R3 | R0 | R1 |  | R2 | R3 | R0 | R1 | R2 | R3 |
| Types |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P0 | 3 | 1 | 1 | 0 | 5 | 2 |  | 1 | 0 | 2 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P1 | 2 | 0 | 0 | 0 | 2 | 1 |  | 0 | 1 | 5 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 | 0 | 0 | 1 | 1 | 0 | 1 |  | 2 | 1 | 7 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 | 2 | 1 | 0 | 0 | 3 | 2 |  | 1 | 1 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 | 0 | 0 | 0 | 1 | 2 | 0 |  | 0 | 2 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Safe;<p0, p1>

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Processes |  | Allocation | |  |  |  | Max | |  |  | Available | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Resource | R0 | R1 | R2 | R3 | R0 | R1 |  | R2 | R3 | R0 | R1 | R2 | R3 |
| Types |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P0 | 3 | 1 | 1 | 0 | 5 | 2 |  | 1 | 0 | 2 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P1 | 2 | 0 | 0 | 0 | 2 | 1 |  | 0 | 1 | 5 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 | 0 | 0 | 1 | 1 | 0 | 1 |  | 2 | 1 | 7 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 | 2 | 1 | 0 | 0 | 3 | 2 |  | 1 | 1 | 7 | 2 | 2 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 | 0 | 0 | 0 | 1 | 2 | 0 |  | 0 | 2 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Safe;<p0, p1,p2>

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Processes |  | Allocation | |  |  |  | Max | |  |  | Available | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Resource | R0 | R1 | R2 | R3 | R0 | R1 |  | R2 | R3 | R0 | R1 | R2 | R3 |
| Types |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P0 | 3 | 1 | 1 | 0 | 5 | 2 |  | 1 | 0 | 2 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P1 | 2 | 0 | 0 | 0 | 2 | 1 |  | 0 | 1 | 5 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 | 0 | 0 | 1 | 1 | 0 | 1 |  | 2 | 1 | 7 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 | 2 | 1 | 0 | 0 | 3 | 2 |  | 1 | 1 | 7 | 2 | 2 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 | 0 | 0 | 0 | 1 | 2 | 0 |  | 0 | 2 | 9 | 3 | 2 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | 9 | 3 | 2 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Safe:P0,P1,P2,P3,P4>

1. If the system is in a safe state then write down the safe sequence and if the system is not

in a safe state then give a reason to support your answer.

**Solution**

**That Sequence < P0,P1,P2,P3,P4> satisfies safety requirement.**