**1.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 资源  进程 | Max | | | Allocation | | | Need | | |
| **A** | **B** | **C** | **A** | **B** | **C** | **A** | **B** | **C** |
| P1 | 5 | 5 | 9 | 2 | 1 | 2 | 3 | 4 | 7 |
| P2 | 5 | 3 | 6 | 4 | 0 | 2 | 1 | 3 | 4 |
| P3 | 4 | 0 | 11 | 4 | 0 | 5 | 0 | 0 | 6 |
| P4 | 4 | 2 | 5 | 2 | 0 | 4 | 2 | 2 | 1 |
| P5 | 4 | 2 | 4 | 3 | 1 | 4 | 1 | 1 | 0 |

A,B,C的Available为2，3，3

T0时刻处于安全状态，安全序列为：P4，P2，P3，P5，P1。

**2.**

Request2(0,3,4)<=Need2(1,3,4)

Request2(0,3,4)>Available(2,3,3)

让P2等待

所以，不能分配。

**3.**

Request4(2,0,1)<=Need4(2,2,1)

Request4(2,0,1)<=Available(2,3,3)

系统暂时假定给P4分配资源：

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 资源  进程 | Max | | | Allocation | | | Need | | |
| **A** | **B** | **C** | **A** | **B** | **C** | **A** | **B** | **C** |
| P1 | 5 | 5 | 9 | 2 | 1 | 2 | 3 | 4 | 7 |
| P2 | 5 | 3 | 6 | 4 | 0 | 2 | 1 | 3 | 4 |
| P3 | 4 | 0 | 11 | 4 | 0 | 5 | 0 | 0 | 6 |
| P4 | 4 | 2 | 5 | 4 | 0 | 5 | 0 | 2 | 0 |
| P5 | 4 | 2 | 4 | 3 | 1 | 4 | 1 | 1 | 0 |

A,B,C的Available为0，3，2

给出一个安全序列：P4, P5, P1, P2, P3。

此时处于安全状态，所以能够实施资源分配

**4.**

Request1(0,2,0)<=Need1(3,4,7)

Request1(0,2,0)<=Available(0,3,2)

系统暂时假定给P1分配资源：

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 资源  进程 | Max | | | Allocation | | | Need | | |
| **A** | **B** | **C** | **A** | **B** | **C** | **A** | **B** | **C** |
| P1 | 5 | 5 | 9 | 2 | 3 | 2 | 3 | 2 | 7 |
| P2 | 5 | 3 | 6 | 4 | 0 | 2 | 1 | 3 | 4 |
| P3 | 4 | 0 | 11 | 4 | 0 | 5 | 0 | 0 | 6 |
| P4 | 4 | 2 | 5 | 4 | 0 | 5 | 0 | 2 | 0 |
| P5 | 4 | 2 | 4 | 3 | 1 | 4 | 1 | 1 | 0 |

A,B,C的Available为0，1，2

此时不存在安全序列，所以不能实施资源分配