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Dekker's Solution

- It is the first known correct solution to the critical section problem.
- It is a software based solution to the critical section problem.
- It is restricted to two processes only.
- It does not guarantees that solution will work correctly on modern architectures.
- It requires two data items to be shared between the two processes.
  int turn;
  boolean flag[2];
- The variable '*turn*' indicates whose turn it is to enter its critical section, e.g. if turn==i then process P_i is allowed to execute in its critical section.
- The flag array is used to indicate if a process is ready to enter its critical section, e.g. if flag[i]=true then it indicates that P_i is ready to enter its critical section.

Structure of process P_i

```
do
{
        flag[i]=true;
        while(flag[j]==true)
        {
                if(turn==j)
                {
                        flag[i]=false;
                        while(turn==j)
                        {
                        }
                        flag[i]=true;
                }
        }
        //Critical Section
        turn=j;
        flag[i]=false;
        //Remainder Section
} while(true);
```

Structure of process P_j

```
do
{
        flag[j]=true;
        while(flag[i]==true)
        {
                if(turn==i)
                {
                        flag[j]=false;
                        while(turn==i)
                        {
                        }
```

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```
                    flag[j]=true;
                }
        }
        //Critical Section
        turn=i;
        flag[j]=false;
        //Remainder Section
} while(true);
```

Questions asked in semester exam:

Question: Give the principles, mutual exclusion in critical section problem. Also discuss how well these principles are followed in Dekker's Solution.

[2016-2017] [5 Marks]

Question: Explain the following terms briefly.

(i) Dekker's Solution
(ii) Busy Waiting

[2014-2015] [10 Marks]

Question: Give the constraints given by Dijkstra that are imposed on any solution for critical section problem. Also, give Dekker's solution for two process and check whether it satisfies the above constraints.

[2014-2015] [5 Marks]

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