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| --- |
| #include <bits/stdc++.h> |
|  | using namespace std; |
|  |  |
|  | int main() |
|  | { |
|  | int n; |
|  | cout<<"Enter number of process\n"; |
|  | cin>>n; |
|  | int r; |
|  | cout<<"Enter no of resoures\n"; |
|  | cin>>r; |
|  | int resources[r]; |
|  | int available[r]; |
|  | for(int i =0;i<r;i++) |
|  | { |
|  | cout<<"Enter number of resources of type "<<(char)(65+i)<<"\n"; |
|  | cin>>resources[i]; |
|  | available[i]=resources[i]; |
|  | } |
|  | int allocated[n][r]; |
|  | for(int i =0;i<n;i++) |
|  | { |
|  | for(int j =0;j<r;j++){ |
|  | cout<<"Enter number of resources of type "<<(char)(65+j)<<" allocated for process P"<<i<<"\n"; |
|  | cin>>allocated[i][j]; |
|  | available[j]= available[j]-allocated[i][j]; |
|  | } |
|  | } |
|  | int max[n][r]; |
|  | for(int i =0;i<n;i++) |
|  | { |
|  | for(int j =0;j<r;j++){ |
|  | cout<<"Enter total number of resources of type "<<(char)(65+j)<<" required for process P"<<i<<"\n"; |
|  | cin>>max[i][j]; |
|  | } |
|  | } |
|  | int need[n][r]; |
|  | for(int i =0;i<n;i++) |
|  | { |
|  | for(int j =0;j<r;j++){ |
|  | need[i][j]=max[i][j]-allocated[i][j]; |
|  | } |
|  | } |
|  | int order[n]; |
|  | bool finish[n]={false}; |
|  | int x=0; |
|  | for(int p =0;p<n;p++) |
|  | { |
|  | for(int i =0;i<n;i++) |
|  | { |
|  | if(finish[i]==true) |
|  | { |
|  | continue; |
|  | } |
|  | else{ |
|  | bool ready = true; |
|  | for(int j =0;j<r;j++) |
|  | { |
|  | if(need[i][j]>available[j]) |
|  | { |
|  | ready=false; |
|  | break; |
|  | } |
|  | } |
|  | if(ready) |
|  | { |
|  | finish[i]=true; |
|  | for(int j =0;j<r;j++) |
|  | { |
|  | available[j]+=allocated[i][j]; |
|  | } |
|  | order[x++]=i; |
|  | } |
|  | } |
|  | } |
|  | } |
|  | int i =0; |
|  | for(i=0;i<n;i++) |
|  | { |
|  | if(finish[i]==false) |
|  | break; |
|  | } |
|  | if(i==n) |
|  | { |
|  | cout<<"System is in safe state\n"; |
|  | cout<<"Safe Sequence: "; |
|  | for(int j =0;j<n-1;j++) |
|  | { |
|  | cout<<"P"<<order[j]<<"->"; |
|  | } |
|  | cout<<"P"<<order[n-1]; |
|  | } |
|  | else{ |
|  | cout<<"System is not in safe state, Deadlock will occur\n"; |
|  | } |
|  | return 0; |
|  | } |