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**GitHub Link:** https://github.com/starboysk/ospro11710408.git

**Code:**

#include<iostream>

using namespace std;

const int np = 5;

const int nr = 4;

static bool finish[np];

int i;

int j;

int ss[5];

int count=0;

int count2=0;

static int avail[nr] = {1,5,2,0};

static int work[nr];

static int allo[np][nr] = {{0,0,1,2},

{1,0,0,0},

{1,3,5,4},

{0,6,3,2},

{0,0,1,4}};

static int mx[np][nr] = {{0,0,1,2},

{1,7,5,0},

{2,3,5,6},

{0,6,5,2},

{0,6,5,6}};

static int need[np][nr];

void calneed(int all[np][nr],int mm[np][nr]){ //function to calculate need

for(i = 0; i<np; i++){

for(j = 0; j<nr; j++){

need[i][j]=mm[i][j]-all[i][j];

}

}

}

bool check(int a,int temp[nr]){ //function to check weather need<work

int count;

for(int k=0;k<nr;k++){

if(need[a][k]<=temp[k]){

count=count+1;

}

}

if(count==nr){

return true;

}

else{

return false;

}

}

void add(int t){ //function to add alocation to work

for(j=0;j<nr;j++){

work[j]=allo[t][j]+work[j];

}

}

int main(){

//int count3=0;

int temp; // Step 1

for(i=0;i<nr;i++){

work[i] = avail[i];

}

for(i=0;i<np;i++){

finish[i] = false;

} // step 1 finished

calneed(allo,mx);

while(count2<np) //loop will run until all the process are completed

{

temp=count2;

for(i = 0; i<np; i++)

{

if(finish[i]==false) // checking the value of false for each process

{

bool ch = check(i,work);

if(ch==true) // cheking need<work

{

finish[i]=true;

add(i);

ss[count2++]=i; // putting the process in sef sequence

}

if(count2==temp){

goto isnot; //if the value of temp is same as count2 then the loop will end

}

cout<<"";

}

}

}

goto istrue;

isnot:

cout<<"System is not in Safe state \n";

goto end;

istrue:

cout<<"Safe Sequence is \n";

for (i = 0; i < np ; i++)

cout << ss[i] << " ";

cout<<"\n System is in safe State \n";

end:

cout<<"Thank you";

}