1. Consider a system with 4 processes and 3 resources with the given resource matrices.

Claim matrix Allocation matrix

3 2 2 1 0 0

6 1 3 6 1 2

3 1 4 2 1 1

4 2 2 0 0 2

The resource vector is [9,3,6]. Write a C program to determine if the system is in safe or unsafe state.

Program:

#include<stdio.h>

int main()

{

int claim[4][3]={{3,2,2},{6,1,3},{3,1,4},{4,2,2}};

int allo[4][3]={{1,0,0},{6,1,2},{2,1,1},{0,0,2}};

int res[3]={9,3,6};

int ava[3]={0,0,0};

for(int j=0;j<3;j++){

for(int i=0;i<4;i++){

ava[j]=allo[i][j];

}

ava[j]=res[j]-ava[j];

}

int finish[4]={0,0,0,0};

int safe\_seq[4];

int num\_fin=0;

while(num\_fin<4){

int safe\_found=0;

for(int i=0;i<4;i++){

if(!finish[i]){

int can\_finish=1;

for(int j=0;j<3;j++){

if(claim[i][j]-allo[i][j]>ava[j]){

can\_finish=0;

break;

}

}

if(can\_finish){

safe\_seq[num\_fin]=i;

num\_fin++;

finish[i]=1;

for(int j=0;j<3;j++){

ava[j]+=allo[i][j];

}

safe\_found=1;

}

}

}

if(!safe\_found){

break;

} }

if(num\_fin==4){

printf("safe sequence:");

for(int i=0;i<4;i++){

printf("%d",safe\_seq[i]);

}

printf("\n the system is in asafe.\n");

}else{

printf("\n the syastem is in an unsafe state\n");

}

return 0;

}

Output:

