NATIONAL INSTITUTE OF TECHNOLOGY
KARNATAKA

OPERATING SYSTEM LAB
EXPERIMENT : 6

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Sec : S2

Code : CS257

Q) Code for Bankers Algorithm

code :

```
#include<bits/stdc++.h>
using namespace std;

int main()
{
	vector<int> ans;

	//number of process

	int n=3;

	//types of resources

	int m=3;

	//allocated resources in allocated matrix

	int tot_allocated[m];
	for(int i=0;i<m;++i)
		tot_allocated[i]=0;

	int allocated[n][m]={{1,2,1},{2,0,1},{2,2,1}};

	//maximum requirement by each process in max matrix

	int max[n][m]={{2,2,4},{2,1,3},{3,4,1}};

	//total resources in system

	int total[m]={5,5,5};

	//calculation of need matrix

	int need[n][m];

	for(int i=0;i<n;++i)
	{
		for(int j=0;j<m;++j)
		{
			need[i][j] = max[i][j] - allocated[i][j] ;


			tot_allocated[j]+=allocated[i][j];
		}
	}
```

```
//eval available resources av=tot-allo;
int available[m];
for(int i=0;i<m;++i)
{
	available[i] = total[i]-tot_allocated[i] ;

}


queue<int> q;
for(int i=0;i<n;++i)
	q.push(i);


while(q.size()!=0)
{
	int i=q.front();


	int flag =1;
	for(int j=0;j<m;++j)
	{
		if(need[i][j]>available[j])
		{
			flag=0;
			break;
		}
	}

	if(flag==1)
	{
		//update available resources

		for(int j=0;j<m;++j)
		{
			available[j]+=allocated[i][j];
		}

		//push in ans

		ans.push_back(i);

		//remove that process from queue

		q.pop();

	}

	else
	{
		//delete from front add to back of queue
```

```
                    q.pop();
                    q.push(i);
                }


        }

        //Note : infinite loop will be indication for system  not  in safe state

        cout<<"\nsystem in safe state\n";
        cout<<"safe sequence is :";

        int k=ans.size();
        for(int i=0;i<k-1;++i)
                cout<<"p"<<ans[i]<<"->";

        cout<<"p"<<ans[k-1]<<endl;
}
```

output :

```
system in safe state
safe sequence is :p1->p0->p2
```

//if system have total[m]={5,5,4} insteed of {5,5,5}
//which result into unsafe state

//a infinite loop

output :

```
student@cclab-HP-EliteDesk-800-G1-TWR:~/Desktop/211cs257$ ./a.out
```