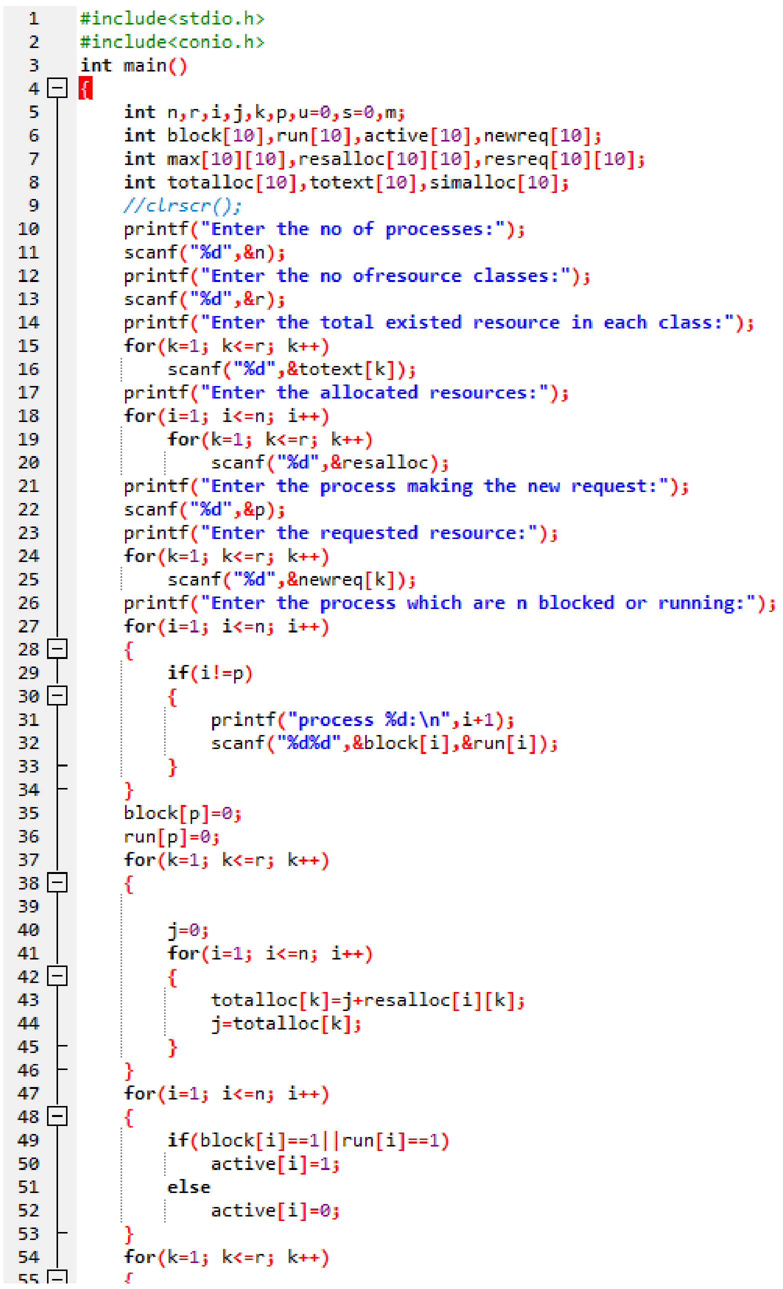
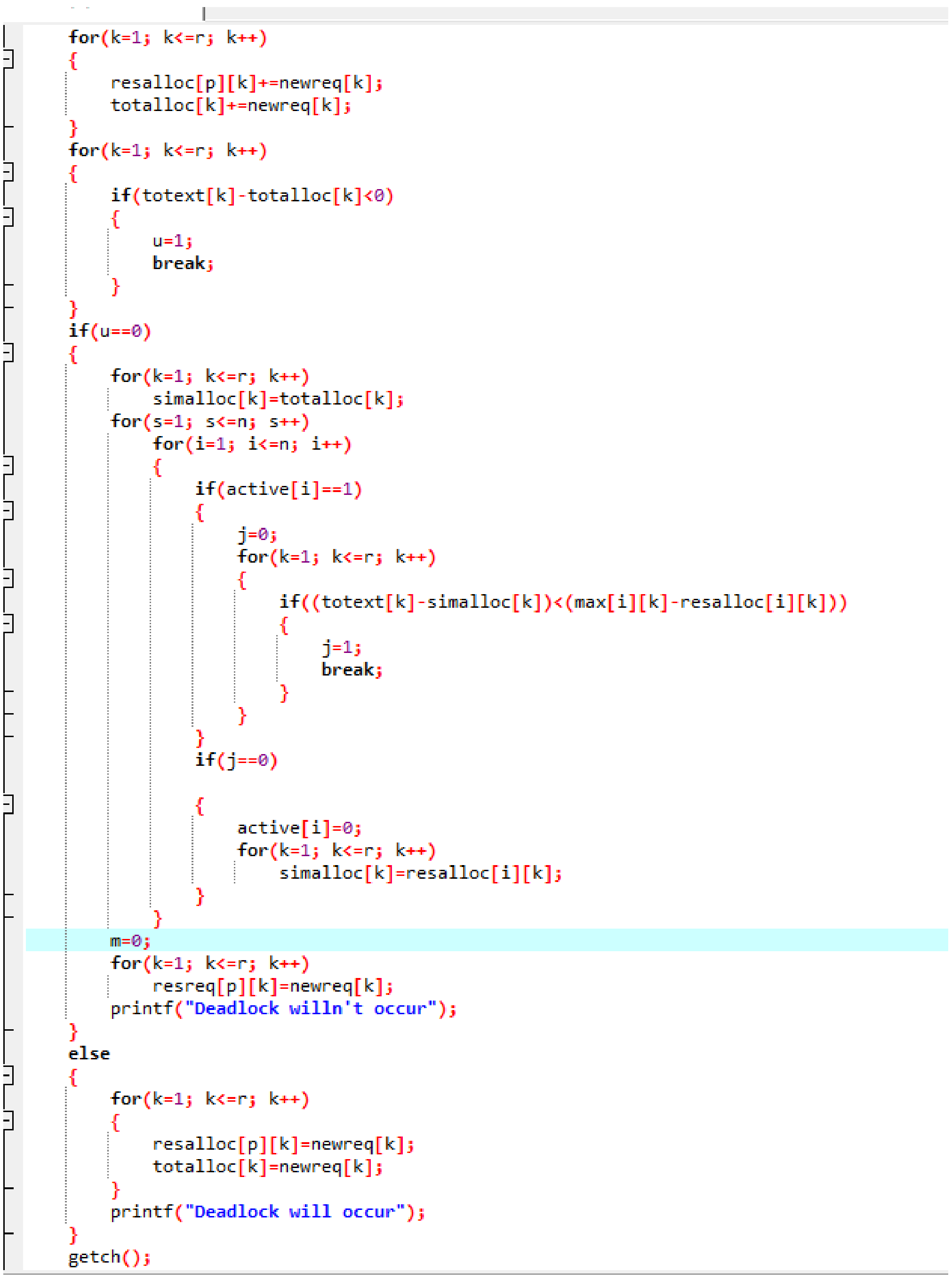
14. Illustrate the deadlock avoidance concept by simulating Banker’s algorithm with C.

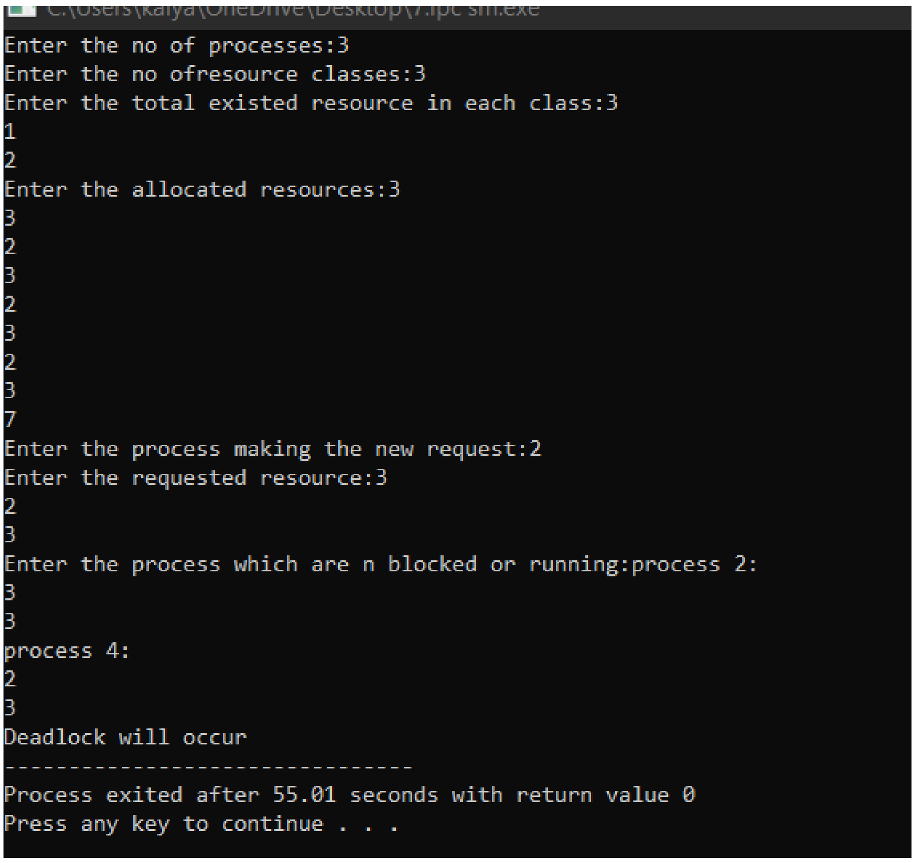


```c
#include<stdio.h>
#include<conio.h>
int main()
{
    int n,r,i,j,k,p,u=0,s=0,m;
    int block[10],run[10],active[10],newreq[10];
    int max[10][10],resalloc[10][10],resreq[10][10];
    int totalloc[10],totext[10],simalloc[10];
    //clrscr();
    printf("Enter the no of processes:");
    scanf("%d",&n);
    printf("Enter the no ofresource classes:");
    scanf("%d",&r);
    printf("Enter the total existed resource in each class:");
    for(k=1; k<=r; k++)
        scanf("%d",&totext[k]);
    printf("Enter the allocated resources:");
    for(i=1; i<=n; i++)
        for(k=1; k<=r; k++)
            scanf("%d",&resalloc);
    printf("Enter the process making the new request:");
    scanf("%d",&p);
    printf("Enter the requested resource:");
    for(k=1; k<=r; k++)
        scanf("%d",&newreq[k]);
    printf("Enter the process which are n blocked or running:");
    for(i=1; i<=n; i++)
    {
        if(i!=p)
        {
            printf("process %d:\n",i+1);
            scanf("%d%d",&block[i],&run[i]);
        }
    }
    block[p]=0;
    run[p]=0;
    for(k=1; k<=r; k++)
    {

        j=0;
        for(i=1; i<=n; i++)
        {
            totalloc[k]=j+resalloc[i][k];
            j=totalloc[k];
        }
    }
    for(i=1; i<=n; i++)
    {
        if(block[i]==1||run[i]==1)
            active[i]=1;
        else
            active[i]=0;
    }
    for(k=1; k<=r; k++)
    {
```



```c
for(k=1; k<=r; k++)
{
    resalloc[p][k]+=newreq[k];
    totalloc[k]+=newreq[k];
}
for(k=1; k<=r; k++)
{
    if(totext[k]-totalloc[k]<0)
    {
        u=1;
        break;
    }
}
if(u==0)
{
    for(k=1; k<=r; k++)
        simalloc[k]=totalloc[k];
    for(s=1; s<=n; s++)
        for(i=1; i<=n; i++)
        {
            if(active[i]==1)
            {
                j=0;
                for(k=1; k<=r; k++)
                {
                    if((totext[k]-simalloc[k])<(max[i][k]-resalloc[i][k]))
                    {
                        j=1;
                        break;
                    }
                }
            }
            if(j==0)

            {
                active[i]=0;
                for(k=1; k<=r; k++)
                    simalloc[k]=resalloc[i][k];
            }
        }
    m=0;
    for(k=1; k<=r; k++)
        resreq[p][k]=newreq[k];
    printf("Deadlock willn't occur");
}
else
{
    for(k=1; k<=r; k++)
    {
        resalloc[p][k]=newreq[k];
        totalloc[k]=newreq[k];
    }
    printf("Deadlock will occur");
}
getch();
```

Output:



```
Enter the no of processes:3
Enter the no ofresource classes:3
Enter the total existed resource in each class:3
1
2
Enter the allocated resources:3
3
2
3
2
3
2
3
7
Enter the process making the new request:2
Enter the requested resource:3
2
3
Enter the process which are n blocked or running:process 2:
3
3
process 4:
2
3
Deadlock will occur
--------------------------------
Process exited after 55.01 seconds with return value 0
Press any key to continue . . .
```