Fatima Jinnah Women University

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LAB 13

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Section: A

Semester: Third

Course: Operating System (LAB)

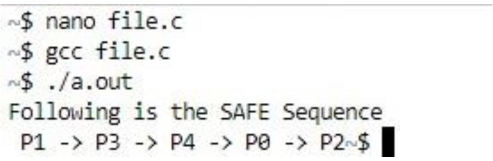
Implement Banker’s Algorithm.

```
#include <stdio.h>

int main()

{

        // P0, P1, P2, P3, P4 are the Process names here


        int n, m, i, j, k;

        n = 5; // Number of processes

        m = 3; // Number of resources

        int alloc[5][3] = { { 0, 1, 0 }, // P0 // Allocation Matrix

                                                { 2, 0, 0 }, // P1

                                                { 3, 0, 2 }, // P2

                                                { 2, 1, 1 }, // P3

                                                { 0, 0, 2 } }; // P4


        int max[5][3] = { { 7, 5, 3 }, // P0 // MAX Matrix

                                        { 3, 2, 2 }, // P1

                                        { 9, 0, 2 }, // P2

                                        { 2, 2, 2 }, // P3

                                        { 4, 3, 3 } }; // P4
```

```
int avail[3] = { 3, 3, 2 }; // Available Resources


int f[n], ans[n], ind = 0;
for (k = 0; k < n; k++) {
    f[k] = 0;
}
int need[n][m];
for (i = 0; i < n; i++) {
    for (j = 0; j < m; j++)
        need[i][j] = max[i][j] - alloc[i][j];
}
int y = 0;
for (k = 0; k < 5; k++) {
    for (i = 0; i < n; i++) {
        if (f[i] == 0) {

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

            if (flag == 0) {
                ans[ind++] = i;
                for (y = 0; y < m; y++)
                    avail[y] += alloc[i][y];
                f[i] = 1;
            }
        }
    }
}

int flag = 1;

for(int i=0;i<n;i++)
{
if(f[i]==0)
{
    flag=0;
    printf("The following system is not safe");
    break;
}
}

if(flag==1)
{
printf("Following is the SAFE Sequence\n");
for (i = 0; i < n - 1; i++)
    printf(" P%d ->", ans[i]);
printf(" P%d", ans[n - 1]);
```

```
}

return (0);
```

OUTPUT:



```
~$ nano file.c
~$ gcc file.c
~$ ./a.out
Following is the SAFE Sequence
 P1 -> P3 -> P4 -> P0 -> P2~$ 
```