Ex. No: 7 Date: 13-10-2023

DEADLOCK

Aim:

To find the safe sequence of the processes using Banker's Algorithm.

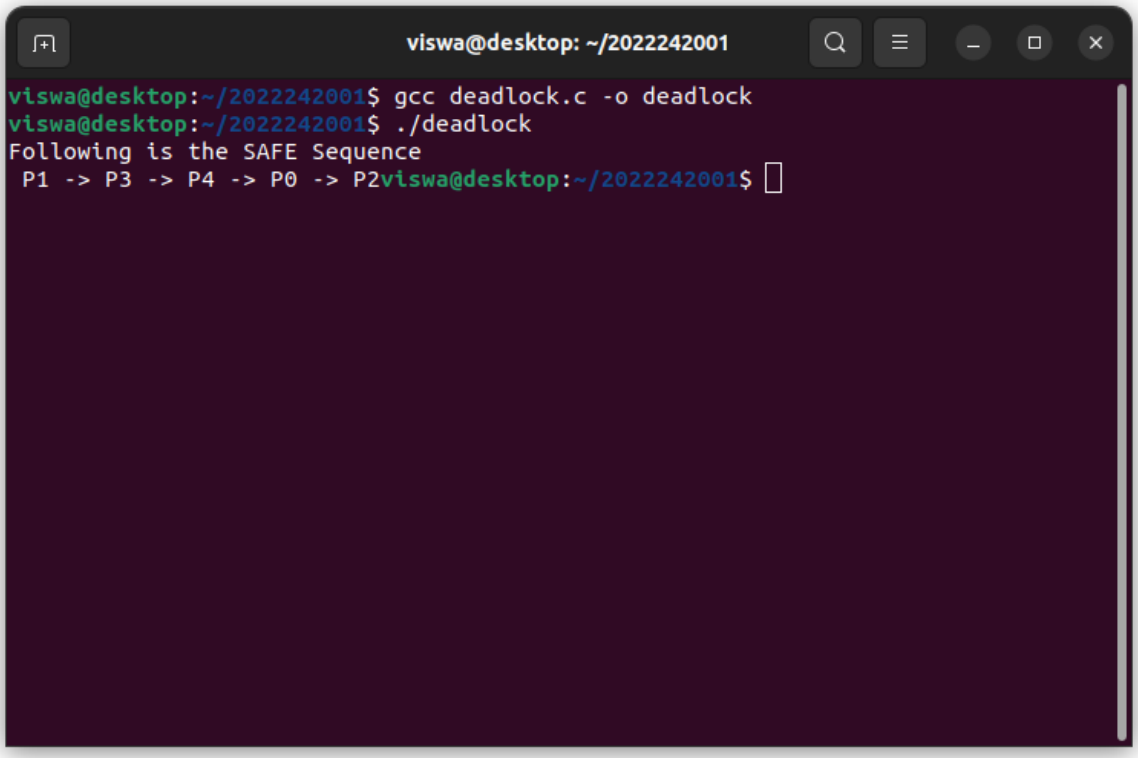
Deadlock:

Deadlock are a set of blocked processes each holding a resource and waiting to acquire a resource held by another process.

Program:

```
#include <stdio.h>
int main(){
    int n, m, i, j, k;
    n = 5;    m = 3;
    int alloc[5][3] = {{0, 1, 0},{2, 0, 0},{3, 0, 2},{2, 1,
1},{0, 0, 2}};
    int max[5][3] = {{7, 5, 3},{3, 2, 2},{9, 0, 2},{2, 2, 2},{4,
3, 3}};
    int avail[3] = {3, 3, 2};
    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;
                }
            }
        }
    }
    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:



Result:

Thus the safe sequence of the processes was found using Banker's Algorithm.