Ex. No.: 9 Date:16.04.2024

## **DEADLOCK AVOIDANCE**

Aim:

To find out a safe sequence using Banker's algorithm for deadlock avoidance.

```
Program Code:
```

```
#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("The SAFE Sequence is \n");
for (i = 0; i < n - 1; i++)
    printf(" P%d ->", ans[i]);
printf(" P%d", ans[n - 1]);
return (0);
}
```

## **Output:**

```
(kali⊗kali)-[~/os/ex9]
$ ./ex9
The SAFE Sequence is
P1 → P3 → P4 → P0 → P2
```

## **Result:**

The above program executed successfully and output got verified.