Experiment – VIII

Aim: WAP to implement Banker’s Algorithm

IDE Used: Dev C++

Code:

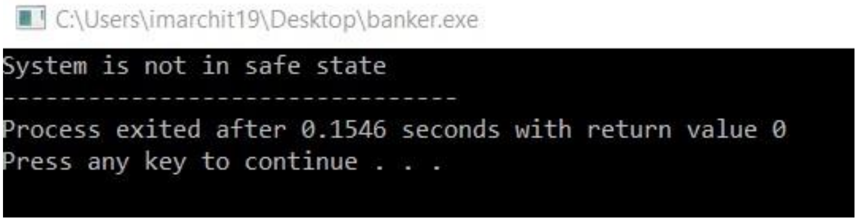
```
#include<iostream>
using namespace std;
const int P = 5;
const int R = 3;

void calculateNeed(int need[P][R], int maxm[P][R],
                                        int allot[P][R])
{
          for (int i = 0 ; i < P ; i++)
                    for (int j = 0 ; j < R ; j++)
                              need[i][j] = maxm[i][j] - allot[i][j];
}

bool isSafe(int processes[], int avail[], int maxm[][R],
                              int allot[][R])
{
          int need[P][R];
          calculateNeed(need, maxm, allot);

          bool finish[P] = {0};
          int safeSeq[P];
          int work[R];
          for (int i = 0; i < R ; i++)
                    work[i] = avail[i];

          int count = 0;
          while (count < P)
```

```
{
    bool found = false;
    for (int p = 0; p < P; p++)
    {
        if (finish[p] == 0)
        {
            int j;
            for (j = 0; j < R; j++)
                if (need[p][j] > work[j])
                    break;
            if (j == R)
            {
                for (int k = 0 ; k < R ; k++)
                    work[k] += allot[p][k];
                safeSeq[count++] = p;
                finish[p] = 1;

                found = true;
            }
        }
    }
    if (found == false)
    {
        cout << "System is not in safe state";
        return false;
    }
}
cout << "System is in safe state.\nSafe"
    " sequence is: ";
for (int i = 0; i < P ; i++)
    cout << safeSeq[i] << " ";
```

```
        return true;
}

int main()
{
        int processes[] = {0, 1, 2, 3, 4};
        int avail[] = {5, 5, 3};
        int maxm[][R] = {{7, 5, 3},
                                                {3, 2, 2},
                                                {1, 6, 2},
                                                {2, 2, 2},
                                                {4, 4, 3}};
        int allot[][R] = {{0, 1, 0},
                                                {2, 0, 0},
                                                {3, 1, 2},
                                                {2, 1, 1},
                                                {0, 0, 2}};
        isSafe(processes, avail, maxm, allot);
        return 0;
}
```

OUTPUT

1. System not safe
    a. Input Avail: {8, 2, 8}
    b. Output:

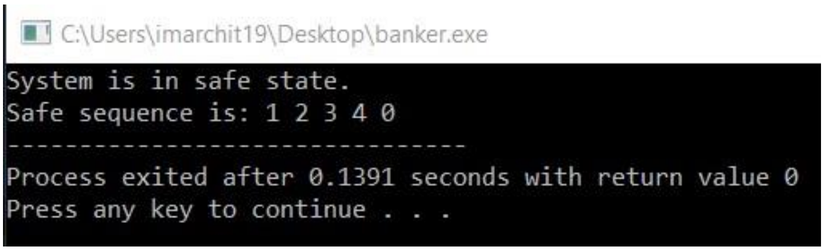


C:\Users\imarchit19\Desktop\banker.exe

```
System is not in safe state
--------------------------------
Process exited after 0.1546 seconds with return value 0
Press any key to continue . . .
```

,

2. System is safe
    a. Input Avail: {5, 5, 3}
    b. Output:



C:\Users\imarchit19\Desktop\banker.exe

```
System is in safe state.
Safe sequence is: 1 2 3 4 0
--------------------------------
Process exited after 0.1391 seconds with return value 0
Press any key to continue . . .
```