Assignment No: 7

Title: BANKER’S ALGORITHM

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1. BANKER’S ALGORITHM.

Code –

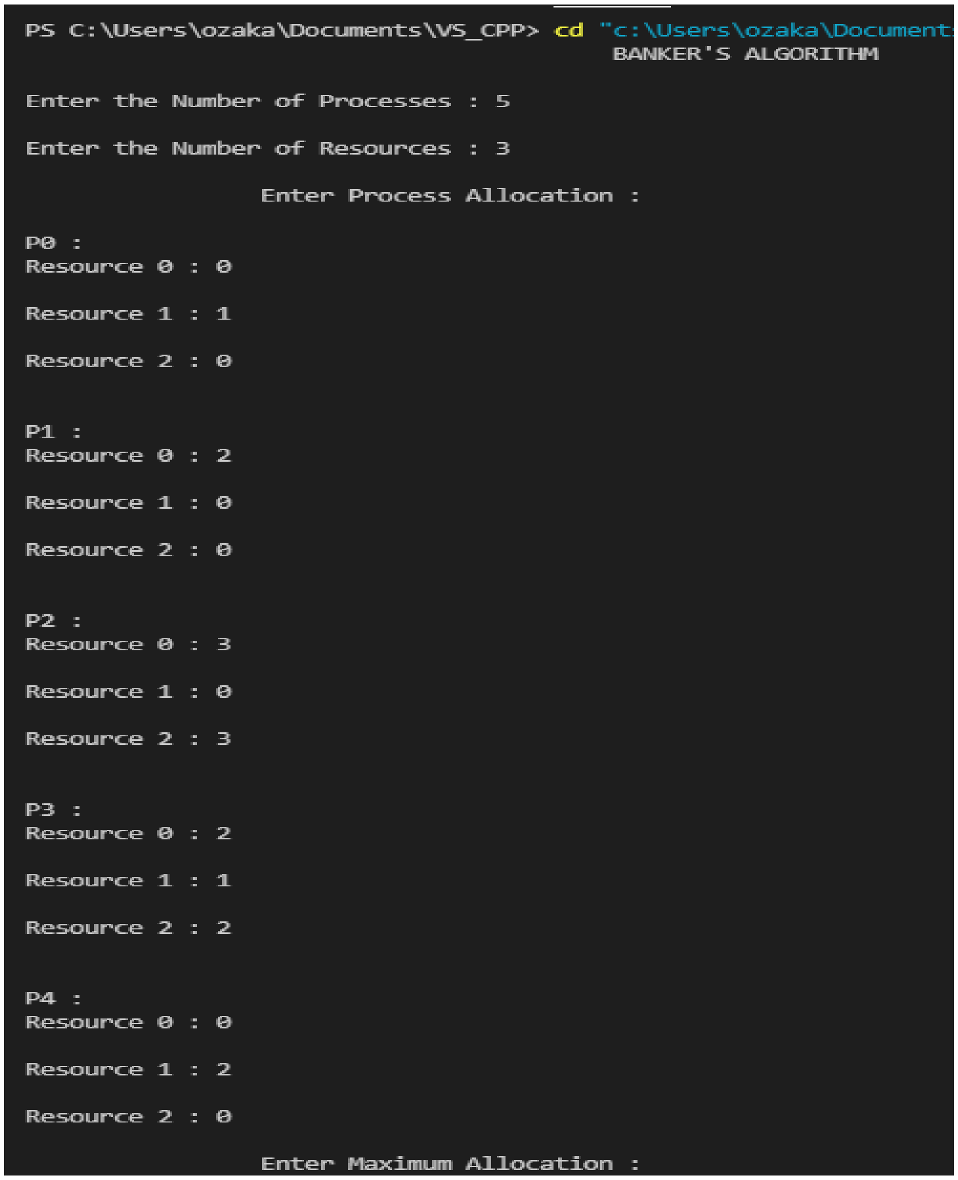
```
#include <iostream> using namespace std; int main()

{
        int i, j, k, n, m, y = 0;
        cout << "\t\t\t\t\tBANKER'S
ALGORITHM";
        cout << "\n\nEnter the Number of
Processes : ";  cin >> n;
        cout << "\nEnter the Number of
Resources : "; cin >> m;        int alloc[n][m],
max[n][m], avail[m];    int f[n], ans[n], ind = 0,
need[n][m];
        cout << "\n\t\tEnter Process Allocation : ";
        for (i = 0; i < n; i++)
        {
        cout << "\n\nP" << i << " : ";
        for (j = 0; j < m; j++)
        {
        cout << "\nResource " << j << " : ";
        cin >> alloc[i][j];
        }
        }
        cout << "\n\t\tEnter Maximum Allocation :
";      for (i = 0; i < n; i++)
```

```
            {
            cout << "\n\nP" << i << " : ";
            for (j = 0; j < m; j++)
            {
            cout << "\nResource " << j << " : ";
            cin >> max[i][j];
            }
            }
            cout << "\n\t\tEnter Available Resources :
";
            for (i = 0; i < m; i++)
            {
            cout << "\nResource " << i << " : ";
            cin >> avail[i];
            }
            cout << "\n\n\n\t\t\tProcess Allocation :
\n\n";
            for (i = 0; i < m; i++)
            {
            cout << "\t\tR" << i;
            }
            for (i = 0; i < n; i++)
            {
            cout << "\nP" << i;
        for (j = 0; j < m; j++)
            {
            cout << "\t\t" << alloc[i][j];
            }
            }
            cout << "\n\n\t\t\tMaximum Allocation :
\n\n";   for (i = 0; i < m; i++)
            {
            cout << "\t\tR" << i;
            }
            for (i = 0; i < n; i++)
            {
            cout << "\nP" << i;
            for (j = 0; j < m; j++)
            {
            cout << "\t\t" << max[i][j];
            }
            }
            cout << "\n\n\t\t\tAvailable Resources :
\n\n";
```

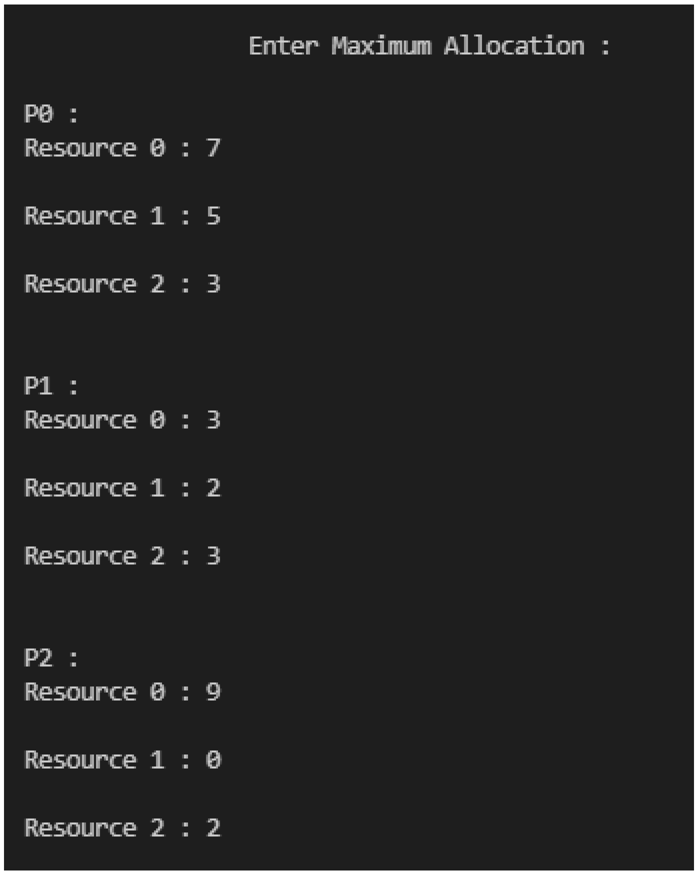
```
            for (i = 0; i < m; i++)
            {
            cout << "\t\tR" << i;
            }
            cout << "\n";
            for (i = 0; i < m; i++)
            {
            cout << "\t\t" << avail[i];
            }
            y
= 0;
            for (k = 0; k < n; k++)
            {
            f[k] =
0;
            }
            for (i = 0; i < n; i++)
            {
            for (j = 0; j < m; j++)
need[i][j] = max[i][j] - alloc[i][j];
            }
            for (k = 0; k < n; 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;
                }
            }
            }
```

```
        }
        cout << "\n\nSAFE PROCESS
SEQUENCE : \n";
        for (i = 0; i < n - 1; i++)
        cout << " P" << ans[i] << "
->";    cout << " P" << ans[n - 1]
<< endl;
        return (0);
}
```

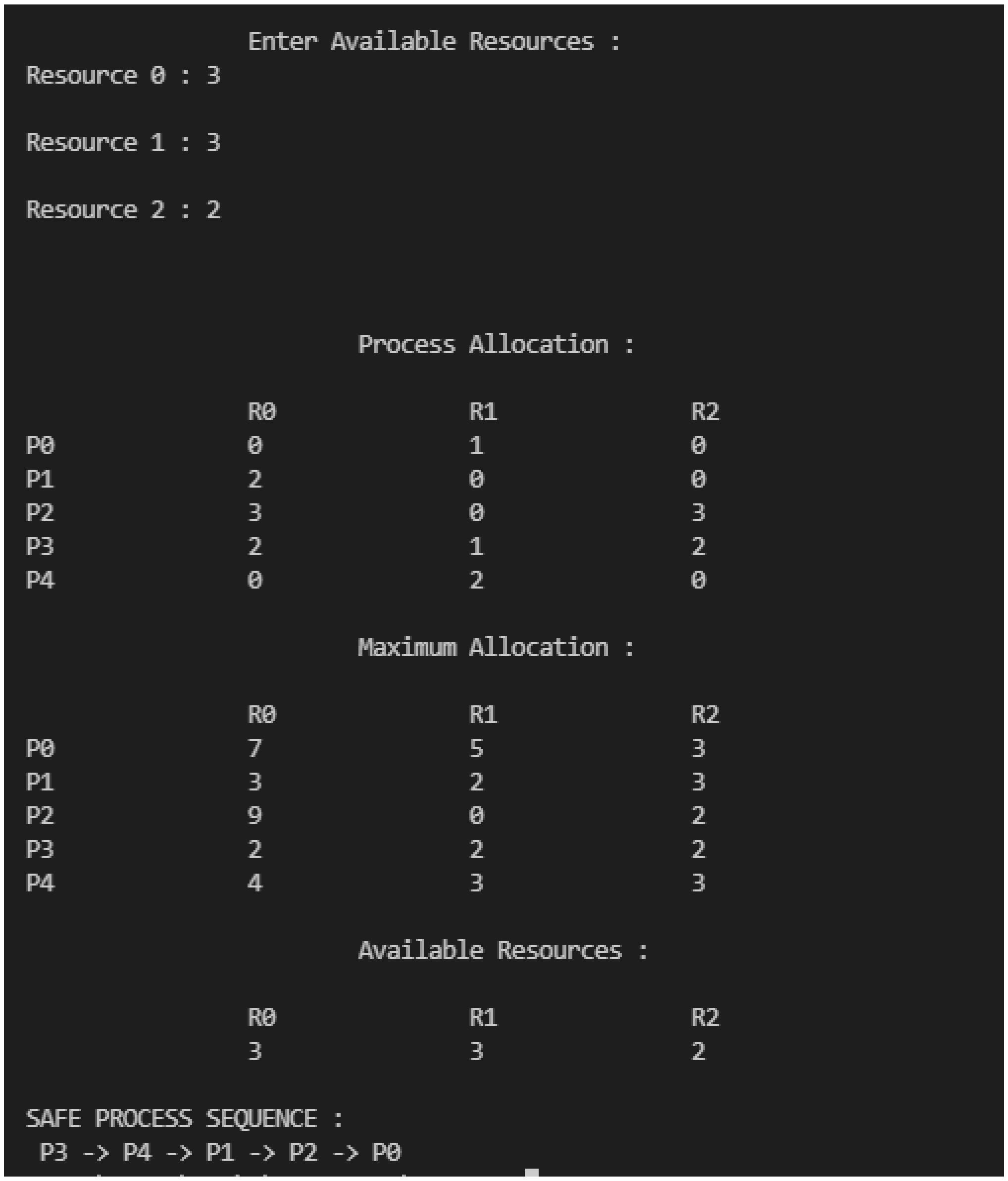
Output –



```
PS C:\Users\ozaka\Documents\VS_CPP> cd "c:\Users\ozaka\Document
                                        BANKER'S ALGORITHM

Enter the Number of Processes : 5

Enter the Number of Resources : 3

                Enter Process Allocation :

P0 :
Resource 0 : 0

Resource 1 : 1

Resource 2 : 0


P1 :
Resource 0 : 2

Resource 1 : 0

Resource 2 : 0


P2 :
Resource 0 : 3

Resource 1 : 0

Resource 2 : 3


P3 :
Resource 0 : 2

Resource 1 : 1

Resource 2 : 2


P4 :
Resource 0 : 0

Resource 1 : 2

Resource 2 : 0

                Enter Maximum Allocation :
```



```
                Enter Maximum Allocation :

P0 :
Resource 0 : 7

Resource 1 : 5

Resource 2 : 3


P1 :
Resource 0 : 3

Resource 1 : 2

Resource 2 : 3


P2 :
Resource 0 : 9

Resource 1 : 0

Resource 2 : 2
```



```
                Enter Available Resources :
Resource 0 : 3

Resource 1 : 3

Resource 2 : 2




                        Process Allocation :

                R0              R1              R2
P0              0               1               0
P1              2               0               0
P2              3               0               3
P3              2               1               2
P4              0               2               0

                        Maximum Allocation :

                R0              R1              R2
P0              7               5               3
P1              3               2               3
P2              9               0               2
P3              2               2               2
P4              4               3               3

                        Available Resources :

                R0              R1              R2
                3               3               2

SAFE PROCESS SEQUENCE :
 P3 -> P4 -> P1 -> P2 -> P0
```