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Assignment#7 - Gold Mine Problem Implementation using Dynamic Programming in any of your preferred Programming Language (C/C++/Java)

Code :

```
#include<bits/stdc++.h>
using namespace std;
int getMax(int num1, int num2)
{
   if(num1<num2)
   {
      return num2;
   }
   else
   {
      return num1;
   }
}

int Max(int num1,int num2,int num3)
{
   if(num1>num2 && num1>num3)
```

```
    {
        return num1;
    }
    else if(num2>num1 && num2>num3)
    {
        return num2;
    }
    else if(num3>num2 && num3>num1)
    {
        return num3;
    }
}
int maximum_value_sell(int c, int r, int matrix[50][50])
{
    int mat[r][c];
    for(int i=0;i<r;i++)
    {
        for(int j=0;j<c;j++)
        {
            mat[i][j]=matrix[i][j];
        }
    }
    int j=0;
    while(j<c)
    {
```

```
    for(int i=0;i<r;i++)
    {
        if(i==0 && j==0)
        {
            continue;
        }
        else if(i!=0 && j==0)
        {
            continue;
        }
        else if(i==0 && j!=0)
        {
            mat[i][j] = mat[i][j] + getMax(mat[i][j-1],mat[i+1][j-1]);
        }
        else if(i==(r-1) && j!=0)
        {
        mat[i][j] = mat[i][j]+getMax(mat[i-1][j-1],mat[i][j-1]);
        }
        else
        {
            mat[i][j]=mat[i][j]+Max(mat[i-1][j-1],mat[i][j-1],mat[i+1][j-1]);
        }
    }
    j++;
}
```

```
    int maximum=0;
}
int Gold_mine(int c, int r, int matrix[50][50])
{
    int mat[r][c];
    for(int i=0;i<r;i++)
    {
        for(int j=0;j<c;j++)
        {
            mat[i][j]=matrix[i][j];
        }
    }
    int j=0;
    while(j<c)
    {
        for(int i=0;i<r;i++)
        {
            if(i==0 && j==0)
            {
                continue;
            }
            else if(i!=0 && j==0)
            {
                continue;
            }
```

```
        else if(i==0 && j!=0)
        {
           mat[i][j] = mat[i][j] + getMax(mat[i][j-1],mat[i+1][j-1]);
        }
        else if(i==(r-1) && j!=0)
        {
           mat[i][j] = mat[i][j]+getMax(mat[i-1][j-1],mat[i][j-1]);
        }
        else
        {
           mat[i][j]=mat[i][j]+Max(mat[i-1][j-1],mat[i][j-1],mat[i+1][j-1]);
        }
     }
     j++;
  }
  cout<<"Gold mine table : "<<endl;
  for(int i=0;i<r;i++)
  {
     for(int j=0;j<c;j++)
     {
        cout<<mat[i][j]<<" ";
     }
     cout<<endl;
  }
  cout<<endl;
```

```
    int maximum=0;
    int f=c-1;
    for(int i=0;i<r;i++)
    {
        if(maximum<=mat[i][f])
        {
            maximum = mat[i][f];
        }
    }
    return maximum;
}
int main()
{
    int row,col;
    cout<<"Enter Row and Column of the matrix\n";
    cout<<"enter Row= ";
    cin>>row;
    cout<<"enter column= ";
    cin>>col;
    int matrix[50][50];
    cout<<"enter matrix: "<<endl;
    for(int i=0;i<row;i++)
        {
            for(int j=0;j<col;j++)
            {
```

```
            cout<<"inputArray["<<i<<"]["<<j<<"] = ";
            cin>>matrix[i][j];
        }
        cout<<endl;
    }
    cout<<"maximum gold found is = "<<Gold_mine(col, row, matrix)<<endl;
    cout<<"one of the sell that we return in main faction is = ("<<maximum_value_sell(col,
    row, matrix)<<","<<row-1<<")"<<endl;
    return 0;
}
```

Output: