13A

```java
import java.util.Scanner;
public class Array13A {
    public static int[][] getTable ( int[][] T ){
        Scanner inp = new Scanner(System.in);
        System.out.print("Enter # row : ");
        int rowUsed = inp.nextInt();
        System.out.print("Enter # col : ");
        int colUsed = inp.nextInt();
        int a[][] = new int [rowUsed][colUsed];
        for ( int i= 0; i < rowUsed ; i++){
            for ( int j= 0; j < colUsed ; j++){
                a[i][j] = inp.nextInt();
            }
        }
        inp.close();
        return a ;
    }
    public static void printTable (int[][] T ){
        for ( int i= 0; i <T.length;i++) {
            for ( int j= 0; j < T[i].length;j++) {
            System.out.print(T[i][j]+"  ") ;
            }
            System.out.println();
        }
    }
    public static int FindLarge(int[][] T) {
        int max = T[0][0];
            for ( int i = 0; i < T.length; i++ ){
                for ( int j = 0; j < T[i].length;j++){
                    if (T[i][j]>max){
                    max=T[i][j];
                }
            }
            System.out.println("Large value is : "+max);
        }
        return max;
    }
    public static int sumColumn(int[][]A,int col){
        int sum = 0;
        for(int i = 0 ; i<A.length ; i++ ){
            sum += A[i][col];
        }
        return sum;
    }
    public static void main(String[] args) {
        int[][] T = new int [10][8];
        int X [][];
        X=getTable(T);
        printTable(X);
        FindLarge(X);
        for ( int i= 0; i <= X.length;i++) {
            System.out.println( "Sum of Column "+(i+1) +" is : "+sumColumn(X,i));

        }

    }
}//Supawit Saengrattnayon 64050694
```

```
C:\WINDOWS\system32\...
Enter # row : 3
Enter # col : 4
1
2
3
4
5
6
7
8
9
8
7
6
1  2  3  4
5  6  7  8
9  8  7  6
Large value is : 4
Large value is : 8
Large value is : 9
Sum of Column 1 is : 15
Sum of Column 2 is : 16
Sum of Column 3 is : 17
Sum of Column 4 is : 18
Press any key to continue . . .
```

```
---------- Java Compile ----------
Picked up JAVA_TOOL_OPTIONS: -Dfile.encoding=UTF-8

Output completed (0 sec consumed) - Normal Termination
```

13A

13A

Supanit Saengrattanayon
6405069 4

```
import java.util.Scanner;
public class Array13A {
   public static int[][] getTable (int[][] T){
      Scanner inp = new Scanner(System.in);
      System.out.print("Enter # row : ");
      int rowUsed = inp.nextInt();
      System.out.print("Enter # col : ");
      int colUsed = inp.nextInt();
      int a[][] = new int [rowUsed][colUsed];
      for (int i=0; i < rowUsed; i++){
        for (int j=0; j < colUsed ; j++){
          a[i][j] = inp.nextInt();
        }
      }
      inp.close();
      return a;
   }
   public static void printTable (int [][] T) {
     for (int i=0; i < T.length ; i++) {
      for (int j=0; j < T[i].length ; j++){
      System.out.print( T[i][j] +" ");
      }
      System.out.println();
     }
   }
   public static int FindLarge (int[][] T){
      int max = T[0][0];
          for (int i=0; i < T.length ; i++) {
            for (int j=0; j < T[i].length ; j++){
              if (T[i][j] > max){
              max = T[i][j];
              }
            }
          System.out.println("Large value is : "+max);
      }
      return max;
   }
   public static int sumColumn(int[][] A, int col){
      int sum = 0
      for (int i=0 ; i < A.length ; i++ ) {
         sum += A[i][col];
      }
      return sum;
   }
   public static void main(String[] args){
      int[][] T = new int [0][0];
      int X [][];
      X = getTable(T);
      printTable(X);
      FindLarge(X);
      for (int i=0; i <= X.length ; i++) {
         System.out.println("Sum of Column :"+(i+1)+" is "+sumColumn(X,i));
      }
   }
}
```

Output!

```
Enter # row : 3
Enter # col : 4
1
2
3
4
5
6
7
8
9
8
7
6
1 2 3 4
5 6 7 8
9 8 7 6
Large value is : 4
Large value is : 8
Large value is : 9
Sum of Column 1 is : 15
Sum of Column 2 is : 16
Sum of Column 3 is : 17
Sum of Column 4 is : 18
```

1) เติมโปรแกรมให้สมบูรณ์ ให้อ่านข้อมูลจำนวนแถว (rowUsed) และจำนวนคอลัมน์ (colUsed) แล้วอ่านข้อมูลทีละจำนวนใส่อาเรย์ สมมุติมีข้อมูลที่จะป้อนดังต่อไปนี้

```
3 4
1 2 3 4
5 6 7 8
9 8 7 6
```

2) เพิ่มเมท็อดสำหรับหาค่ามากที่สุดในตาราง และพิมพ์ค่ามากที่สุด

Largest value is ___9___

3) เพิ่มเมท็อดสำหรับหาผลรวมค่าในคอลัมน์ของตาราง มีตัวแปรรับค่าคอลัมน์ที่จะหาผลรวม

```
public static int sumColumn(int[][] A, int  col) {
    int s um = 0;
    for (int i = 0 ; i < A.length; i++)
        sum = sum + A[ i ][ col ];                    // varying row, fix col
    return sum;
    }
```

4) เพิ่มคำสั่งเรียกใช้เมท็อดเพื่อพิมพ์ผลรวมแต่ละคอลัมน์ที่เหมาะสม เช่น

Sum of Column 1 is ___15___
Sum of Column 2 is ___16___
Sum of Column 3 is ___17___
Sum of Column 4 is ___18___

```
for ( int i= 0; i < rowUsed; .....) {
   print( "Sum of Column "+(i+1)+" is "+sumColumn( .... , i);
```

13B

```java
public class Array13B {
    public static void printMatrix(int[][]A){
        for (int i=0; i<A.length ; i++) {
            for (int j=0; j< A[i].length; j++) {
                System.out.print(A[i][j] + " ");
            }
            System.out.println();
        }
    }
    public static int[][] matrixProduct(int[][]A,int[][] B){
        int[][] C = new int[A.length][B[0].length];
        for (int i = 0; i < A.length; i++){
            for (int j = 0; j < B[0].length; j++){
                C[i][j] = 0;
                for (int k = 0; k < B.length; k++){
                    C[i][j] = C[i][j]+(A[i][k] * B[k][j]);
                }
            }
        }
        return C ;
    }
    public static void main(String[] args) {
        int [][] X = { { 1 , 2 , 3  } , { 1 , 0 , 2  } , { 2 , 1 , -1 }};
        int [][] Y = { { 1 , 2 , -1 , 2} ,{ 1 , 0 ,  2 , 1} , { 2 , 1 , -1 , 3}};
        int [][] Z ;
        Z = matrixProduct(X, Y);
        printMatrix(X);
        System.out.println();
        printMatrix(Y);
        System.out.println();
        printMatrix(Z);
    }
}//Supawit Saengrattanayon 64050694
```

```
C:\WINDOWS\system32\c...
1 2 3
1 0 2
2 1 -1

1 2 -1 2
1 0 2 1
2 1 -1 3

9 5 0 13
5 4 -3 8
1 3 1 2
Press any key to continue . . .
```

```
---------- Java Compile ----------
Picked up JAVA_TOOL_OPTIONS: -Dfile.encoding=UTF-8

Output completed (0 sec consumed) - Normal Termination
```

13B

13B

Saparit Saengrattanayon
6405069

```
public class Array13B
    public static void printMatrix(int[][] A) {
        for (int i = 0; i < A.length ; i++) {
            for (int j=0 ; j < A[i].length ; j++){
                System.out.print(A[i][j] + " ");
            }
            System.out.println();
        }
    }
    public static int[][] matrixProduct(int[][] A, int[][] B){
        int[][] c = new int [A.length][B[0].length];
        for (int i = 0; i < A.length ; i++) {
          for (int j = 0 ; j < B[0].length ; j++){
            C[i][j] = 0;
            for (int k = 0 ; k < B.length ; k++) {
                C[i][j] = C[i][j] + (A[i][k] * B[k][j]);
            }
          }
        }
        return C ;
    }
    public static void main(String[] args){
      int[][] X = {{1,2,3},{1,0,2},{2,1,-1}};
      int[][] Y = {{1,2,-1,2},{1,0,2,1},{2,1,-1,3}};
      int[][] Z ;
      Z = matrixProduct(X,Y);
      printMatrix(X);
      System.out.println();
      printMatrix(Y);
      System.out.println();
      printMatrix(Z);
```

Output :

```
1 2 3
1 0 2
2 1 -1

1 2 -1 2
1 0 2 1
2 1 -1 3

9 5 0 13
5 4 -3 8
1 3 1 2
```