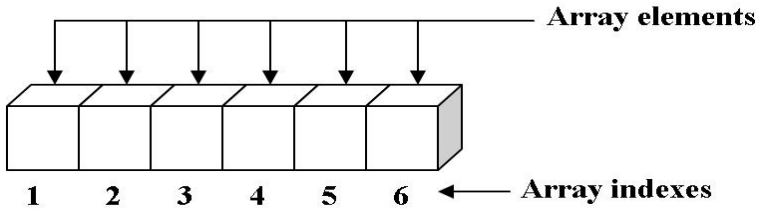
Java Array

I. ដូចម្តេចទៅដែលហៅថា Array?

Array សំដៅលើប្រភេទអញ្ញាតិពិសេសមួយដែលអាចមានលទ្ធភាពធ្វើការ Store ទិន្នន័យបានច្រើនស្ថិតក្នុងប្រភេទទិន្នន័យរួមគ្នាមួយហើយមានលក្ខណៈបណ្តុះអាសន្ន ពោលគឺវាផ្ទុកនៅលើ RAM។ Array ក្នុង Java ត្រូវបានគេបែងចែកជា ៣ប្រភេទគឺ ៖

១). Array One Dimensional(Array មួយវិមាត្រ)

Array 1D គឺជាប្រភេទ Array ដែល Store ទុកទិន្នន័យមានលក្ខណៈ ជា Records ដែលយើងអាច Accessing វាបានទៅតាម Index នៃ Record នីមួយៗរបស់វា។



One-dimensional array with six elements

ឧទាហរណ៍ ១៖

```
Start Page | DemoArray.java *
class DemoArray{
public static void main(String args[]){
  int a[]=new int[5];//declaration and instantiation
   a[0]=10;//initialization
   a[1]=20;
   a[2]=70;
   a[3]=40;
   a[4]=50;
//printing array
      for(int i=0;i<a.length;i++)//length is the property of array
          System.out.println(a[i]);
 }
}
```

លទ្ធផលទទួលបាន៖

```
General Output
--------------------Configurati
10
20
70
40
50

Process completed.
```

ឧទាហរណ៍ ២៖

Start Page | DemoArray.java ×

```
class DemoArray{
public static void main(String args[]){
 String[] stringArray = new String[5];
    stringArray[0] = "ETEC";
    stringArray[1] = "IT";
    stringArray[2] = "Professional";
    stringArray[1] = "Training";
    stringArray[2] = "Center";
    System.out.println("stringArray output");
    for (int i=0; i<stringArray.length; i++)
    {
      System.out.println(stringArray[i]);
    }
 }
}
```

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General Output

```
--------------------Configurat
stringArray output
ETEC
Training
Center
null
null

Process completed.
```

ឧទាហរណ៍ ៣៖

Start Page | DemoArray.java ×

```
class DemoArray{
public static void main(String args[]){
 int[] intArray = new int[] {100,500,800,50,60,73,88};
    System.out.println("intArray output (version 2)");
    for (int i=0; i<intArray.length; i++)
    {
      System.out.println(intArray[i]);
    }
 }
}
```

លទ្ធផលទទួលបាន៖

General Output

```
--------------------Configuratio
intArray output (version 2)
100
500
800
50
60
73
88
```

ឧទាហរណ៍ ៤៖

Start Page DemoArray.java

```
import java.util.Random;
class DemoArray{
public static void main(String args[]){
 int[] a = new int[100];
    Random ran=new Random();
    int n=20;
    System.out.println("intArray output (version 2)");
   //Random 1-100 with N number
    for (int i=0; i<n; i++)
    {
      a[i]=ran.nextInt(100) + 1;
    }
    //Output Array
    for (int i=0; i<n; i++)
    {
      System.out.print (a[i] + "  ");
    }
 }
}
```

លទ្ធផលទទួលបាន៖

General Output

```
--------------------Configuration: <Default>--------------------
intArray output (version 2)
84  74  22  99  88  8  56  33  29  7  66  10  93  74  61  75  45  61  75  96
Process completed.
```

លំហាត់អនុវត្តន៍

១). ចូរបង្កើតនូវ Array ចំនួន ៤ ដូចជា Id(String), Name(String) និង Score(double) បន្ទាប់មកអោយគេបញ្ចូលចំនួន N ដង់ហើយបង្ហាញលទ្ធផលទាំងនោះចេញមកក្រៅវិញ?

២) ចូរបង្កើតនូវ Array Score(double) ចំនួន N ជាតុ បន្ទាប់មកចាប់តំលៃចៃដន្យនៅចំលោះ 1 ដល់ 100 ហើយបោះលទ្ធផលចេញមកក្រៅវិញ ជាមួយនិង TotalScore, Average និង Grade score នីមួយតាមលក្ខណៈដូចខាងក្រោម៖

មធ្យមភាព/Average	និទេស/Grade
90-100	A
80-90	B
70-80	C
60-70	D
50-60	E
0-50	F

ឧទាហរណ៍ ៦៖

Start Page | DemoArray.java *

```
import java.util.Random;
import java.util.*;
class DemoArray{
public static void main(String args[]){
       int[] a = new int[100];
       String st;
       Scanner objin=new Scanner(System.in);
       int n=0,op,i;
      do{
       System.out.print("1. Input\n");
       System.out.print("2. Output\n");
       System.out.print("3. Search\n");
       System.out.print("Please Choose One=");
       op=objin.nextInt();
       switch(op)
       {
         case 1:{
            System.out.print("Input N=");
            n=objin.nextInt();
             for(i=0;i<n;i++)
             {
                  System.out.print("Input Array=");
                  a[i]=objin.nextInt();
             }
         }break;

         case 2:{
              for(i=0;i<n;i++)
              {
                  System.out.print(a[i]);
              }
         }break;
        case 3:{
            int svalue;
            int b=0;;
            System.out.println ("Input Value to Search=");
            svalue=objin.nextInt();
            for(i=0;i<n;i++)
            { if(a[i]==svalue)
                System.out.println ("Search found");
                b=1;
                break;
            }
            if(b==0) System.out.println ("Search not found");
         }break;
       }
       System.out.print("Press Yes to Continue...!");
       st=objin.next();
      }while(st.equals("yes"));
  }
}
```

លទ្ធផលទទួលបាន៖

```
General Output
--------------------Configuration: <Default>-
1. Input
2. Output
3. Search
Please Choose One=
```

ឧទាហរណ៍ ៧៖

Start Page | DemoArray.java

```
import java.util.Random;
import java.util.*;
class DemoArray{
    int i;
     Scanner objin=new Scanner(System.in);
    void Input(int a[],int n)
    {
            for(i=0;i<n;i++)
            {
                System.out.print("Input Array=");
                a[i]=objin.nextInt();
            }
    }
    void Output(int a[],int n)
    {
          for(i=0;i<n;i++)
            {
                System.out.print(a[i]+ "    ");
            }
    }
    int search(int a[],int n)
    {
            int svalue;
            int index=-1;
            System.out.println ("Input Value to Search=");
            svalue=objin.nextInt();
            for(i=0;i<n;i++)
            { if(a[i]==svalue)
                {
                 index=i;
                 break;
                }
            }
            return index;
    }

    void Update(int a[],int n)
    {
            int nvalue;
            int index=search(a,n);
            if(index==-1)
            {
                System.out.println (".....Search not found.....");
            }
            else
            {
                System.out.println ("Input New Value=");
                nvalue=objin.nextInt();
                a[index]=nvalue;
                System.out.println ("Update Completed.....!");
            }
    }
    void Delete(int a[],int n)
    {    int index=search(a,n);
            if(index==-1)
            {
                System.out.println (".....Search not found.....");
            }
            else
            {
                for(i=index;i<n;i++)
                {
                    a[i]=a[i+1];
                }
                n=n-1;
               Output(a,n);
            }
    }
```

```
    void Sort(int a[],int n)
    {     int t,j;
          for(i=0;i<n;i++)
          {
             for(j=i+1;j<n;j++)
             {
                  t=a[i];
                  a[i]=a[j];
                  a[j]=t;
             }
          }
    }

public DemoArray()
{
      int[] a = new int[100];
       String st;

       int n=0,op,i;
      do{
       System.out.print("1. Input\n");
       System.out.print("2. Output\n");
       System.out.print("3. Search\n");
       System.out.print("4. Update\n");
       System.out.print("5. Delete\n");
       System.out.print("6. Sort\n");
       System.out.print("Please Choose One=");
       op=objin.nextInt();

      switch(op)
      {
        case 1:{
           System.out.print("Input N=");
           n=objin.nextInt();
           Input(a,n);
        }break;

        case 2:{
            Output(a,n);
        }break;
        case 3:{
            int index=search(a,n);
           if(index==-1)
            System.out.println ("Search not found");
           else
            System.out.println ("Search found at " + index);
        }break;
        case 4:{
            Update(a,n);
        }break;
        case 5:{
            Delete(a,n);
        }break;
        case 6:{
            Sort(a,n);
        }break;
      }
       System.out.print("\nPress Yes to Continue...!");
       st=objin.next();
      }while(st.equals("yes"));
}
public static void main(String args[]){
      new DemoArray();
 }
}
```

២). Array Two Dimensional(Array ពីរវិមាត្រ)

គឺជាប្រភេទ Array *ដែលអាចផ្ទុកទិន្នន័យមានលក្ខណៈជា* Row *និង* Column *ពោល វាវាងជាតារាងទិន្នន័យមួយដែលអ្នកអាច*Access *ទិន្នន័យបាន តាមរយៈ* Index *របស់* Row *និង* index Column*។*

	Column 0	Column 1	Column 2	Column 3
Row 0	a[0][0]	a[0][1]	a[0][2]	a[0][3]
Row 1	a[1][0]	a[1][1]	a[1][2]	a[1][3]
Row 2	a[2][0]	a[2][1]	a[2][2]	a[2][3]

ឧទាហរណ៍ ១៖

Start Page | DemoArray.java *

```
import java.util.*;
class DemoArray{
public static void main(String args[]){
    int i,j;
    String[][] names = { {"Sam", "Smith"},
                         {"Robert", "Delgro"},
                         {"James", "Gosling"},
                       };
   //i read row
   for(i=0;i<3;i++)
   { //j Read Col
    for(j=0;j<2;j++)
    {
        System.out.print(names[i][j]);
    }
    System.out.println ("");
   }
 }
}
```

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```
General Output
--------------------Configurati
SamSmith
RobertDelgro
JamesGosling

Process completed.
```

ឧទាហរណ៍ ២៖

```
Start Page | DemoArray.java ×
import java.util.*;
class DemoArray{
public static void main(String args[]){
    int[][] board = new int[3][3];
     for (int i = 0; i < board.length; i++)
     {
          for (int j = 0; j < board[i].length; j++)
           {
              board[i][j] = i + j;
           }
     }
     for (int[] a : board) {
        for (int i : a) {
           System.out.print(i + "\t");
             }
              System.out.println("\n");
           }
}
}
```

លទ្ធផលទទួលបាន៖

```
General Output
--------------------Confi
0   1   2

1   2   3

2   3   4
```

ឧទាហរណ៍ ៣៖

```
Start Page | DemoArray.java ×
import java.util.*;
class DemoArray{
public static void main(String args[]){
int k=0;
int row, col, i, j;
int arr[][] = new int[10][10];
Scanner scan = new Scanner(System.in);
 System.out.print("Enter Number of Row for Array (max 10) : ");
  row = scan.nextInt();
 System.out.print("Enter Number of Column for Array (max 10) : ");
  col = scan.nextInt();
 System.out.print("Enter " +(row*col)+ " Values : \n");
    for(i=0; i<row; i++)
    {
     for(j=0; j<col; j++)
     {
       arr[i][j] = scan.nextInt();
       k=k+arr[i][j];
     }
    }
   for(i=0; i<row; i++)
  {
    for(j=0; j<col; j++)
    {
      System.out.print(arr[i][j]+ " ");
    }
      System.out.println();
  }
  //Sum Array
    System.out.println("Total is:" +k);

 }
}
```

ឧទាហរណ៍ ៣៖

Start Page | DemoArray.java

```
import java.util.*;
class DemoArray{
public static void main(String args[]){
 int[][] source = {
            {1, 2, 3, 4},
            {5, 6},
            {0, 2, 42, -4, 5}
            };

      int[][] destination = new int[source.length][];

      for (int i = 0; i < source.length; ++i) {

         // allocating space for each row of destination array
         destination[i] = new int[source[i].length];
         System.arraycopy(source[i], 0, destination[i], 0, destination[i].length);
      }

      // displaying destination array
      System.out.println(Arrays.deepToString(destination));
 }
}
```

លទ្ធផលទទួលបាន៖

General Output

```
--------------------Configuration: <Default>-----------
[[1, 2, 3, 4], [5, 6], [0, 2, 42, -4, 5]]

Process completed.
```

លំហាត់អនុវត្តន៍

១)ចូរបង្កើត Array មួយឈ្មោះ Product ជា ពីរវិមាត្រ ដែលមាន ១oRows និង 3 Column ហើយបញ្ចូលទិន្នន័យលក្ខណៈ ID, Name, Price ចូលក្នុង Array ទាំងនេះ និងបង្ហាញចេញ មកក្រៅវិញតាមជួរដេក និងជួរឈរច្បាស់លាស់?

២) ចូរបង្កើតនូវ Array 2 វិមាត្រអាចអោយគេបញ្ចូលពត៌មានចំនួន NRow និង NCol បន្ទាប់មកបង្ហាញជាតុទាំងនោះចេញមកក្រៅវិញតែជាតុណាជាតុគូរ?