Example

Consider the following various array declarations:

int [] ar1, arr2[];

int[][] arr3;

int[] arr4[], arr5[];

Which of the following options are true?

arr2 = arr3;

arr2 = arr4;

arr1 = arr2;

arr4 = arr1;

Output

The correct answer is A and B.

Explanation: There is a difference between int[] i; and int i[]; although in both the cases i is an array of integer values. Therefore the correct option is A and B as they are the declarations of the integer. The basic difference is that if you declare multiple variables in the same statement such as int [] i, j; and int i[], j; then it Implies that i and j are not of the same type.

Example

Imagine you need to handle the records of multiple students and declaring a separate variable and then assigning the values will become a tedious task. Therefore, you write the following program to implement the concept of arrays which has simplified your task:

Source code

```
public class Ques
 { public static void main(String args[]) {
  String[][][] arr = {
                        {
                         { "Suchita", "Vikash" , "Deepak"},
                         { "Charu", null, "Shikha"}
```

```
                    },
                    {
                       {"Shalini"}, {null}
                    },
                    {
                       {"Hemal"}
                    },
                    {
                        { "Santosh", "Manish"}, {}
                    }
                };
        System.out.println(arr[0][1][1]);
 }
}
```

What will be the output after compilation and execution of the preceding program?

A. The program will throw the runtime exception.

B. The program will throw ArrayIndexOutOfBoundsException.

C. The program will display null.

D. The program will compile successfully but it will not display anything.

Output

The correct option is C.

Explanation: The program deals with three dimensional array and will display null as following is the structure of elements assigned to the arr array.

arr[0][0][0] = Suchita

arr[0][0][1] = Vikash

arr[0][0][2] = Deepak

arr[0][1][0] = Charu

arr[0][1][1] = null

arr[0][1][2] = Shikha

arr[1][0][0] = Shalini

arr[1][1][0] = null
arr[2][0][0] = Hemal
arr[3][0][0] = Santosh
arr[3][0][1] = Manish
Therefore, if you try to print the value of the arr[0][1][1] element of the arr array, then the null value will be displayed

Example

Sam works in Xyz Company as Java programmer and he designed the following program:

Source Code

```
class Rose{
public void sam() {
 int y[] = {4, 2, 8};
 for (int x=2; x<1+3*2-4; x++){
 System.out.print(x+" ");
 for (int j:y) {
     j=j*x-4;
 System.out.print(j+" ");
 }
 }
 }
 public static void main(String[] args) {
 Rose r = new Rose();
 r.sam();
 }
}
```

What would be the output of this program? Choose the correct option from the following:

A. The program displays 2 4 2 8 B. The program displays 2 4 0 12

C. The program displays 2 4 4 16 D. The program displays 3 4 0 12

Correct option is B.

Explanation: Correct option is B. Firstly the value of the variable x is 2, which is less than the 3 (Value specified in expression) therefore control will transfer into for each loop and prints the array variable with Modifications according to the expression. Array element is fetched into j. First array element is 4 and the Expression is j*x-4 i.e. 4*2-4=4. In the same way, other array elements are extracted and displayed with modifications.

Example

Sam as a developer in Dkinfotech created the following program

```
class Rose {
 static int j;
 public int arr() {
 int y[] = { 5 , 7, 8 , 6};
 j = y[2]; return j;
 }
 public static void main (String args[]) {
 Rose r=new Rose();
 int x = r.arr( );
 System.out.println(x);
 switch(x) {
 case 0: System.out.print(0 + " ");break;
 case 2: System.out.print(2 + " ");break;
 case 8: System.out.print(8 + " ");
 case 5: System.out.print(5 + " ");break;
 default: System.out.print("Default");
 }
 }
```

}

What would be the output when Sam compile and execute this program?

A. Program will not compile successfully B. Program will display 8 8 5

C. Program will display 8 5 D. Program will display 8

Option B is the correct answer.

Explanation: Option B is the correct answer. Firstly the control will transfer to arr () method and retrieves the array element at array [2] index and returns that value to calling routine. In the calling routine the retrieved value is first displayed and then used in switch statement. Therefore, the result is 8 8 and 5 is displayed because the case 8 does not have break and 5 is the statement written in next case. Therefore, options C and D are incorrect. Option A is incorrect because program will successfully compile.

Two Dimensional Arrays

Two dimensional array is used for create the matrix but it is not a matrix internally.

Syntax:

```
datatype  variablename[][];
or
datatype [][]variablename;
or
datatype []variablename[];
e.g int []a,b[][],c[];
//here a is single dimension b is three dimension and c is two dimension
```

Memory allocation

```
variablename= new datatype[size][size];
```

Example

```
import java.util.*;
```

```
public class MatrixApplication
{
   public static void main(String x[])
   {
       Scanner xyz  = new Scanner(System.in);
        int a[][]=new int[3][3];
      System.out.println("Enter the values in matrix");
       for(int i=0; i<a.length; i++)
      {
            for(int j=0; j<a[i].length; j++)
            {    a[i][j]=xyz.nextInt();
            }
      }
      System.out.println("display the matrix");
        for(int i=0; i<a.length; i++)
        {
             for(int j=0; j<a[i].length; j++)
             { System.out.printf("%d\t",a[i][j]);
            }
         System.out.printf("\n");
        }
   }
}
```

Jagged Array

Jagged Array is facility in java where we can create the matrix every row having different column list called as jagged array.

Example we want to create the matrix like as

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

Syntax :

datatype variablename[][]=new datatype[rowsize][];

variablename[rowindex]=new datatype[colsize];

Example

```
import java.util.*;
public class MatrixApplication{
   public static void main(String x[])
   {
      Scanner xyz  = new Scanner(System.in);
       int a[][]=new int[3][];
         a[0]=new int[3];
         a[1]=new int[4];
         a[2]=new int[2];
     System.out.println("Enter the values in matrix");
      for(int i=0; i<a.length; i++)
     {
            for(int j=0; j<a[i].length; j++)
            {    a[i][j]=xyz.nextInt();
            }
     }
     System.out.println("display the matrix");
       for(int i=0; i<a.length; i++)
       {    for(int j=0; j<a[i].length; j++)
              { System.out.printf("%d\t",a[i][j]);
              }
        System.out.printf("\n");
       }
   }
}
```