

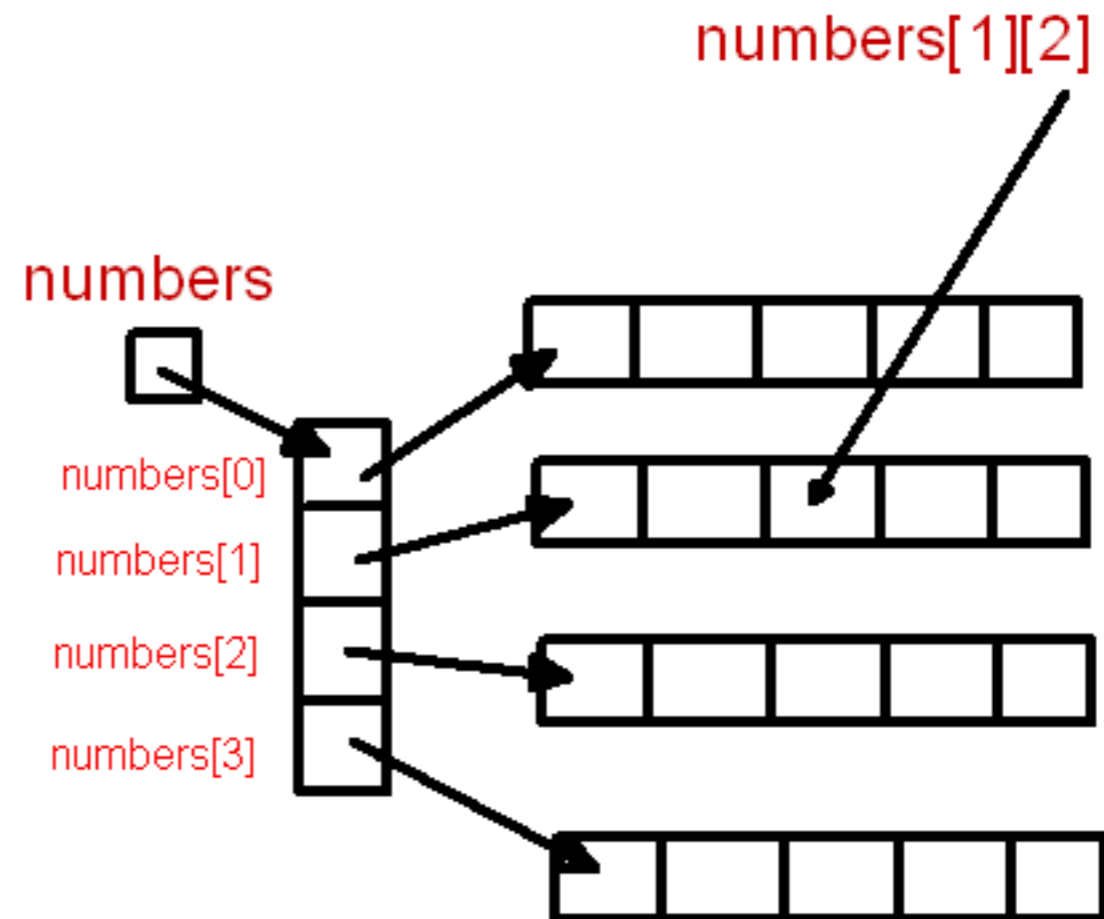
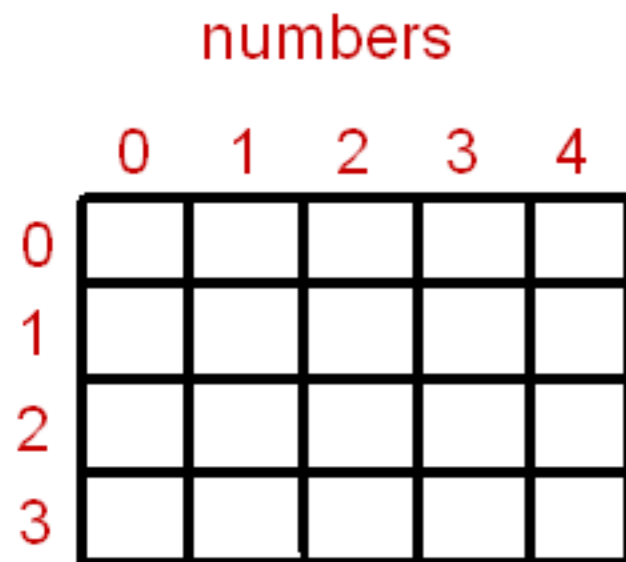
Chapter 9 - Sections 7-8

Two-Dimensional Arrays & Enhanced For Loop

Def. A two-dimensional array is a multi-dimensional array containing rows and columns.

Example #1 - Declare a two-dimensional array.

```
int[][] numbers = new int[4][5]
```



Example #2 - Initialize a two-dimensional array.

One Element At a Time:

```
numbers[0][0] = 5; numbers[0][1] = 10; numbers[0][2] = 15; numbers[0][3] = 20; numbers[0][4] = 25;  
numbers[1][0] = 30; numbers[1][1] = 35; numbers[1][2] = 40; numbers[1][3] = 45; numbers[1][4] = 50;  
numbers[2][0] = 55; numbers[2][1] = 60; numbers[2][2] = 65; numbers[2][3] = 70; numbers[2][4] = 75;  
numbers[3][0] = 80; numbers[3][1] = 85; numbers[3][2] = 90; numbers[3][3] = 95; numbers[3][4] = 100;
```

Initializer Lists:

```
int[][] numbers = {{5,10,15,20,25}, {30,35,40,45,50}, {55,60,65,70,75}, {80,85,90,95,100}};
```

Use Loops Along With Text File (Data Base):

```
for (int row=0; row<4; row++){  
    for (int col=0; col<5; col++) {  
        numbers[row][col] = reader.nextInt();  
    }  
}
```

Text File

```
5 10 15 20 25  
30 35 40 45 50  
55 60 65 70 75  
80 85 90 95 100
```

Text File

```
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
```

Example #3 - Sum the Numbers in a Two-Dimensional Array

```
sum = 0;
for (int x=0; x<numbers.length; x++) {
    for (int y=0; y<numbers[x].length; y++) {
        sum = sum + numbers[x][y];
    }
}
```

Example #4 - Sum the Numbers in Each Row of a Two-Dimensional Array

```
int[] rowSum = new int[numbers.length];

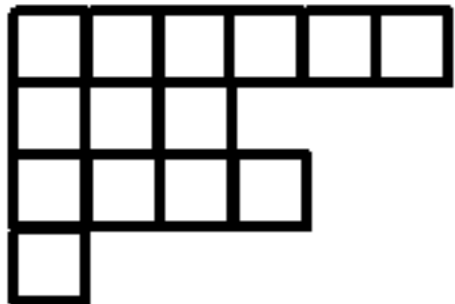
for (int x=0; x<numbers.length; x++) {
    for (int y=0; y<numbers[x].length; y++) {
        rowSum[x] = rowSum[x]+ numbers[x][y];
    }
}
```

Example #6 - Ragged Arrays

The rows of a two-dimensional array do not have to be the same length.

```
int[ ][ ] numbers;  
numbers = new int[4][ ];  
numbers[0] = new int[6];  
numbers[1] = new int[3];  
numbers[2] = new int[4];  
numbers[3] = new int[1];
```

numbers



Example #7 - Enhanced For Loops

```
int[] abc = {2,3,4};
int sum = 0;
int element;

for (int x = 0; x < abc.length; x++) {
    element = abc[x];
    sum = sum + element;
}
```

```
int[] abc = {2,3,4};
int sum = 0;

for (int element: abc) {
    sum = sum + element;
}
```

```
int[][] table = {{2,3,4},{2,3,4},{2,3,4}};
int sum = 0;

for (int [] row: table) {
    for (int element: row) {
        sum = sum + element;
    }
}
```