



ASIF.I/O

Data Structure

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Data Structure



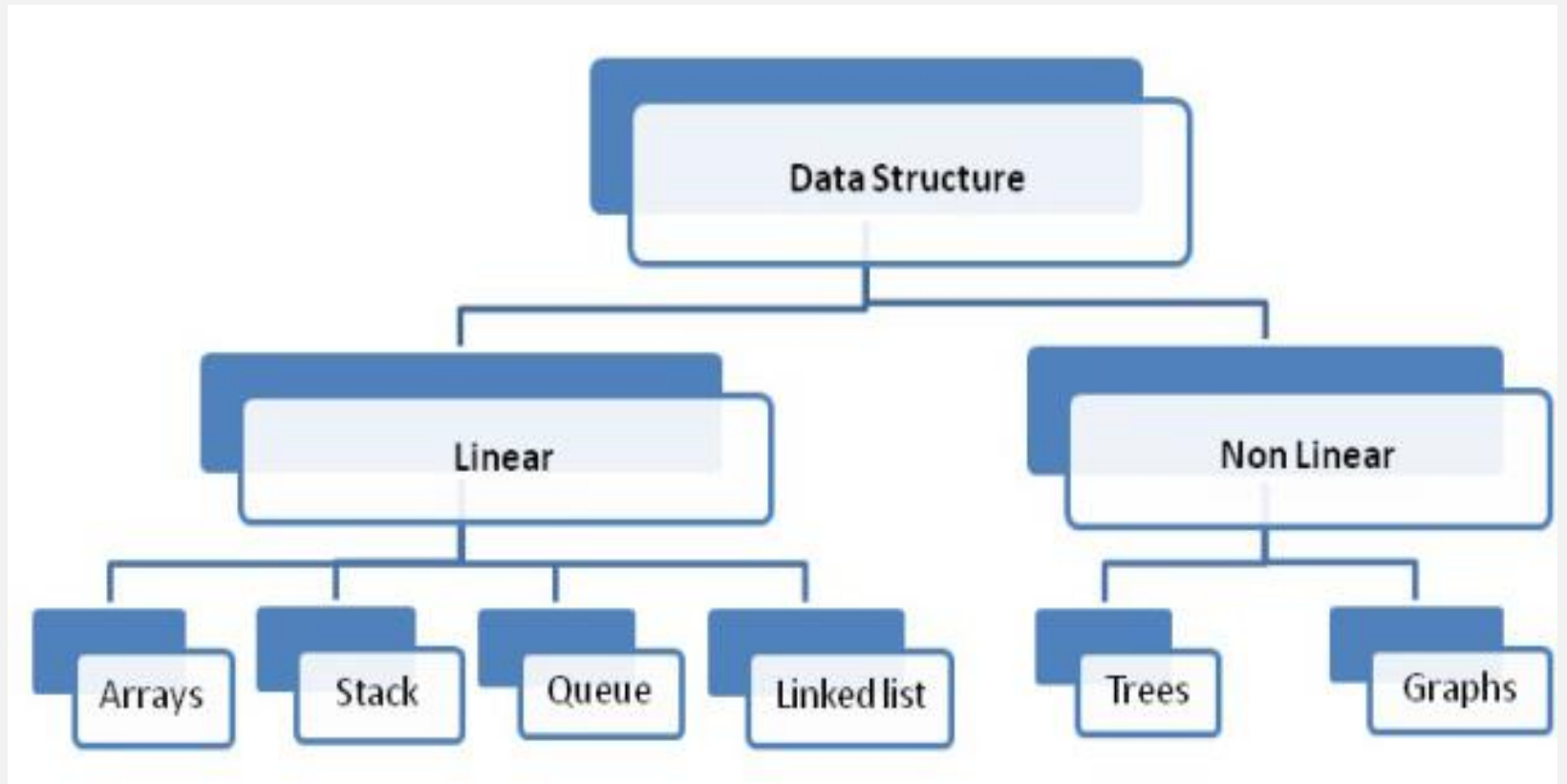
Data Structure

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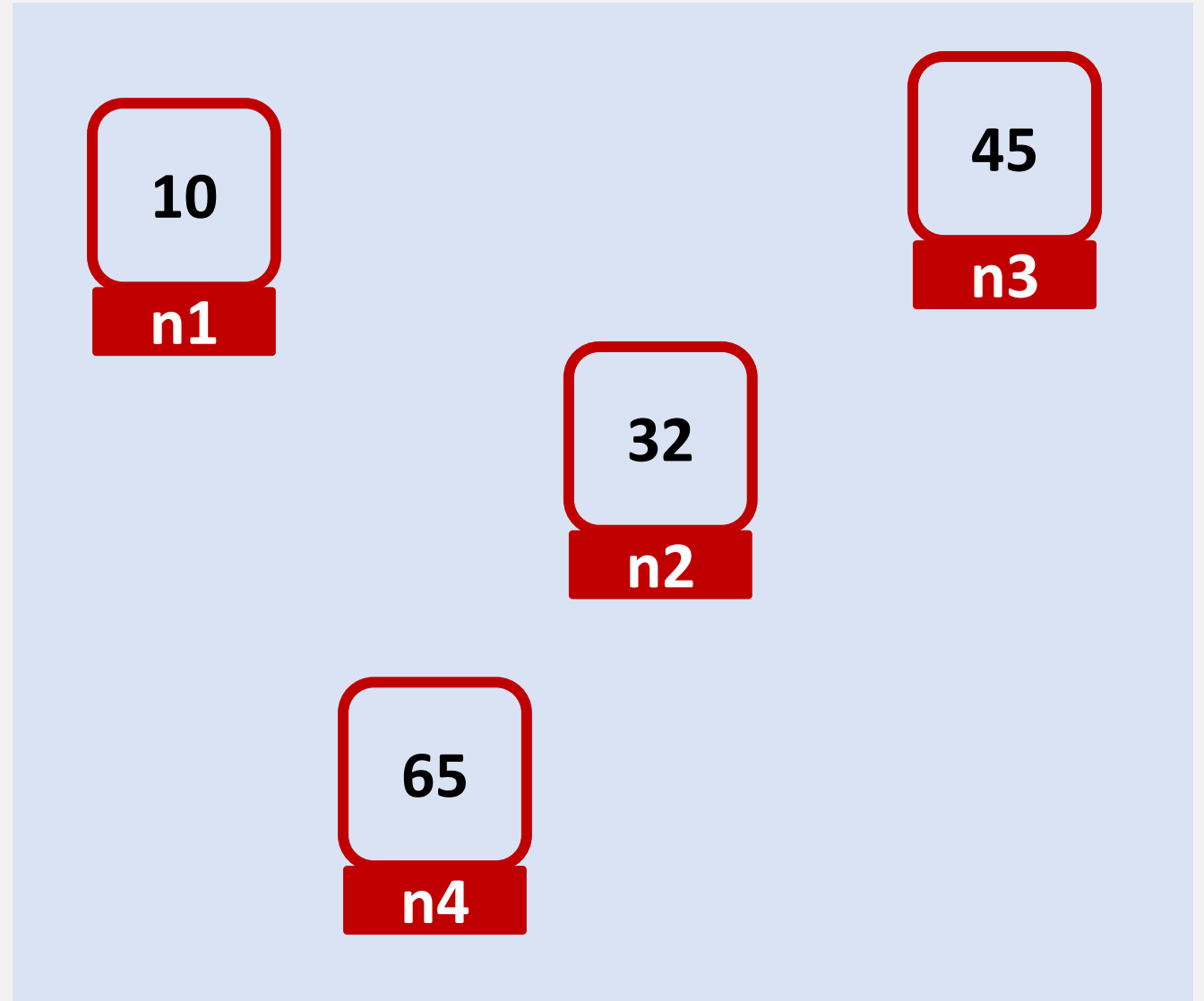
Arrays

```
int n1 = 10;
```

```
int n2 = 32;
```

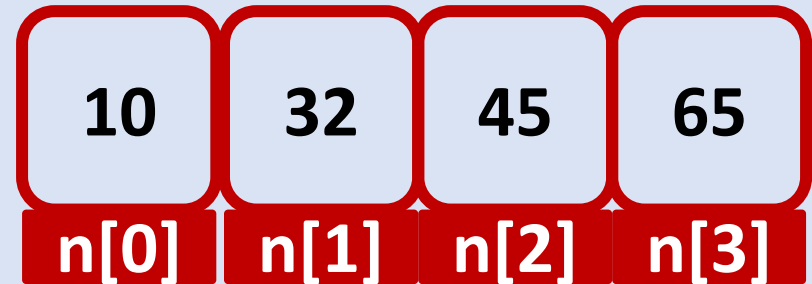
```
int n3 = 45;
```

```
int n4 = 65;
```



Arrays

```
int[] n = {10,32,45,65}
```



Arrays

☞ **Array** in java is an object which contains elements of a similar data type.

☞ The elements of an array are stored in a continuous memory location.

☞ It is a data structure where we store similar elements.

How to declare an array

```
3 ▶ public class Concept_of_Array {  
4 ▶   public static void main(String[] args) {  
5       //Declaring and initializing arrays  
6       String name[] = {"Pikachu", "Balbasore", "Squital"};  
7       int roll[] = {230, 101, 502};  
8       char powers[] = {'E', 'P', 'W'};  
9
```

```
String[] name = new String[6];  
//Taking input in array dynamically  
for (int i = 0; i < name.length; i++) {  
    System.out.println("Enter name at index "+i);  
    name[i] = in.nextLine();  
}
```


Some Basic Operation on Arrays

1. Searching

Searching an element in an array.

2. Inserting

Inserting an element at a particular index of an array.

3. Deleting

Deleting an element at a particular index of an array.

4. Sorting

Sorting an array in ascending or descending order.

5. Merging

Merging two arrays in one single array.

Merging Two Arrays

Arr1 =

2	5	4	7	11
0	1	2	3	4

Arr2 =

21	43	76	23	27
0	1	2	3	4

Arr3 =

2	5	4	7	11	21	43	76	23	27
0	1	2	3	4	5	6	7	8	9

Merging Code

```
3 import java.util.Arrays;
4
5 public class Merging {
6     public static void main(String[] args) {
7         int[] arr1 = {1,2,3,4};
8         int[] arr2 = {9,8,7,6};
9         int arr3[] = new int[8];
10
11         //Merging Logic
12         for (int i = 0; i < arr1.length; i++) {
13             arr3[i] = arr1[i];
14         }
15         for (int i = 0; i < arr2.length; i++) {
16             arr3[i+arr1.length] = arr2[i];
17         }
18         //Printing Arrays
19         System.out.println("arr1 = " + Arrays.toString(arr1));
20         System.out.println("arr2 = " + Arrays.toString(arr2));
21         System.out.println("arr3 = " + Arrays.toString(arr3));
22     }
```

arr1 = [1, 2, 3, 4]

arr2 = [9, 8, 7, 6]

arr3 = [1, 2, 3, 4, 9, 8, 7, 6]

Process finished with exit code

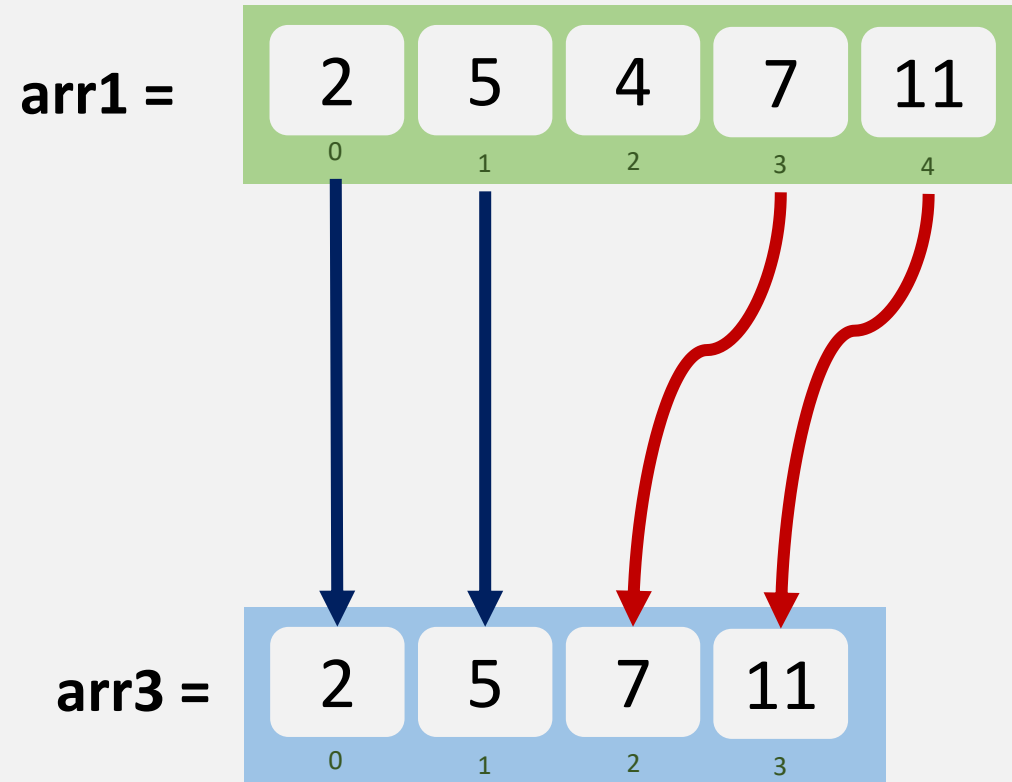
Deleting a element from an arrays

We want to delete the element at index 2.

Index = 2

Element value = 4

Array name = arr1



Deleting - Code

```
7 public static void main(String[] args) {
8     Scanner in = new Scanner(System.in);
9     int[] arr1 = {1,2,3,4,5,12};
10    int[] arr3 = new int[arr1.length - 1];
11
12    System.out.println("Enter index number : ");
13    int index = in.nextInt();
14    // ...
15    for (int i = 0; i < arr1.length; i++) {
16        if(i < index){
17            arr3[i] = arr1[i];
18        } else if (i > index) {
19            arr3[i-1] = arr1[i];
20        }
21    }
22
23    System.out.println("arr1 " + Arrays.toString(arr1));
24    // System.out.println("arr2 " + Arrays.toString(arr2));
25    System.out.println("arr3 " + Arrays.toString(arr3));
26 }
27 }
```

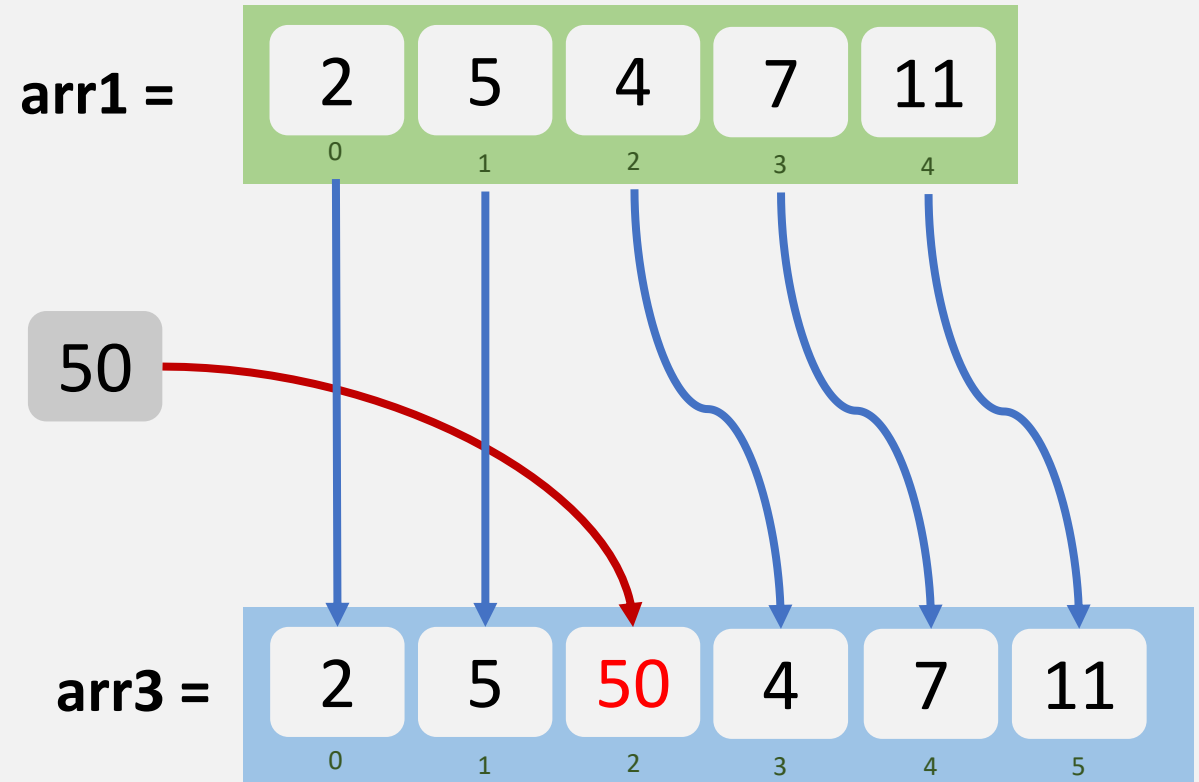
Inserting a element from an arrays

We want to insert an element at index 2.

Index (index) = 2

Element value (element) = 50

Array name = arr1



Inserting - Code

```
6 public class Inserting {
7     public static void main(String[] args) {
8         Scanner in = new Scanner(System.in);
9         int[] arr1 = {2,5,4,7,11};
10        int[] arr3 = new int[arr1.length + 1];
11
12        System.out.println("Enter index number : ");
13        int index = in.nextInt();
14        System.out.println("Enter the value : ");
15        int x = in.nextInt();
16
17        arr3[index] = x; //Inserting
18        //merging rest of array
19        for (int i = 0; i < arr1.length; i++) {
20            if(i<index){
21                arr3[i] = arr1[i];
22            } else if (i ≥ index) {
23                arr3[i+1] = arr1[i];
24            }
25        }
26        System.out.println("arr1"+ Arrays.toString(arr1));
27        System.out.println("arr3"+ Arrays.toString(arr3));
```

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Enter index number :

2

Enter the value :

50

arr1[2, 5, 4, 7, 11]

arr3[2, 5, 50, 4, 7, 11]

Process finished with exit co

2D-Array

```
int x[][] = new int[3][4]
```

It simple means I want matrix of 3 rows and 4 columns

x[0][0]	x[0][1]	x[0][2]	x[0][3]
x[1][0]	x[2][1]	x[1][2]	x[1][3]
x[2][0]	x[2][1]	x[2][2]	x[2][3]

```
int x[][] = {{10,20,30,40},{50,60,70,80},{90,110,120,130}}
```

10	20	30	40
50	60	70	80
90	110	120	130

2D - Code

```
6  ▶ public static void main(String[] args) {
7      Scanner in = new Scanner(System.in);
8      int matrix[][] = new int[3][4];
9      //Accepting the value for matrix
10     for (int i = 0; i ≤ 2; i++) {
11         for ( j = 0; j ≤ 3; j++) {
12             System.out.println("element at ["+i+"]["+j+"]");
13             matrix[i][j]= in.nextInt();
14         }
15     }
16
17     //Printing the matrix
18     for (int i = 0; i ≤ 2; i++) {
19         for ( j = 0; j ≤ 3; j++) {
20             System.out.print(matrix[i][j]+" | ");
21         }
22         System.out.println();
23     }
24 }
```


Java by ASIF.IO

THANK
YOU

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