DAY-23

12 July 2023 15:06

ARRAYS

WHY ARRAYS ?

1. EMP1 int emp1;
2. EMP2 int emp2
3. EMP3 int emp3
4. EMP4 int emp4
5. EMP5 int emp5

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\-
\-

N. EMP N int empN

MANY VARIABLES ARE DECLARED AND MEMORY ALLOCATED TO EACH VARIABLE

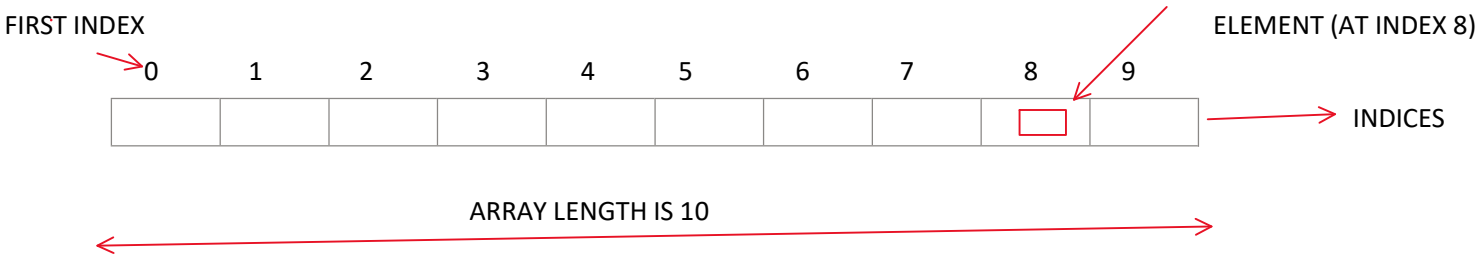
CODE IS NOT OPTIMISED

EXECUTION TIME IS MORE

FETCHING DATA IS NOT EASY

WHAT ARE ARRAYS ?

- ARRAY IS A COLLECTION OF SIMILAR TYPE OF ELEMENTS WHICH HAS CONTIGOUS MEMORY LOCATION
- THE ELEMENT OF AN ARRAY ARE STORED IN A CONTIGOUS MEMORY LOCATION
- WE CAN STORE ONLY A FIXED SET OF LEMENTS IN A JAVA ARRAY
- ARRAY IN JAVA IS INDEX-BASED, THE 1ST ELEMENT OF THE ARRAY IS STORED AT THE 0TH INDEX , 2 ND ELEMENT IS STORED ON 1ST INDEX AND SO ON



ADVANTAGES OF ARRAYS

- **CODE OPTIMIZATION :** IT MAKES THE CODE OPTIMIZED, WE CAN RETRIEVE OR SORT THE DATA EFFICIENTLY
- **RANDOM ACCESS :** WE CAN GET ANY DATA LOCATED AT AN INDEX POSITION
- **MEMORY OPTIMIZATION :** IT SAVES A LOT OF MEMORY
- COLLECTION OF HOMOGENOUS DATA
- EXECUTION TIME IS LESS

DISADVANTAGES OF ARRAYS

- **SIZE LIMIT :** WE CAN STORE ONLY THE FIXED SIZE OF ELEMENTS IN THE ARRAY. IT DOESN'T GROW ITS SIZE AT RUN TIME
- WE CAN ONLY **HOMEGENOUS DATA**
- **MEMORY SPACE :** IF WE DECLARE THE ARRAY OF SIZE 100 AND ONLY USE 2 MEMORY SPACE THEN THE REST OF THE MEMORY WILL BE WASTED AND GO UNUSED

PROPERTIES OF ARRAY

- ARRAY ARE OF FIXED SIZE
- IT CAN STORE ONLY HOMOGENOUS DATA
- ARRAY INDEX ALWAYS STARTS FROM 0

HOW TO DECLARE ARRAY VARIABLE ?

- ARRAY IS A COLLECTION OF SIMIALR DATA TYPE ELEMENTS OR HOMOGENOUS ELEMENTS

SYNTAX :

```
DATATYPE [] VARIABLE_NAME = NEW DATATYPE[SIZE];

DATATYPE VARIABLE_NAME [] = NEW DATATYPE [SIZE]
```

EXAMPLE :

1,2,3,4,5,6,7,8,9,10

```
int [] array1 = new int[10];
```

1	2	3	4	5	6	7	8	9	10
0	1	2	3	4	5	6	7	8	9

INDEX OF ARRAY WILL ALWAYS RANGE FROM 0 TO (SIZE OF ARRAY -1)

- DOUBLE ARRAY OF SIZE 5

```
double [] doubleArray = new double[5]
```

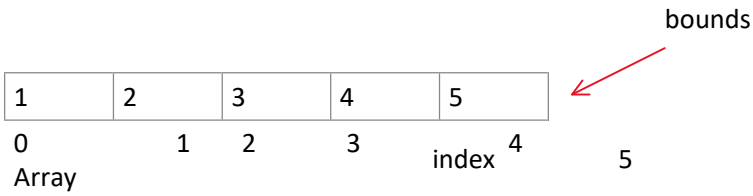
- CHAR ARRAY OF SIZE 20

```
Char [] charArray = new char[20];
```

Example :

```
class Test1
{
    public static void main(String[] args)
```

```
    {
        int[] a1 = new int[5];

        a1[0] = 1;

        a1[1] = 2;

        a1[2] = 3;

        a1[3] = 4;

        a1[4] = 5;

        System.out.println(a1[0] );
        System.out.println(a1[1] );
        System.out.println(a1[2] );
        System.out.println(a1[3] );
        System.out.println(a1[4] );



    }
}
```



arrayIndexOutofBoundsException

```
class Test1
{
    public static void main(String[] args)
    {
        int[] a1 = new int[5];

        a1[0] = 1;

        a1[1] = 2;

        a1[2] = 3;

        a1[3] = 4;

        a1[4] = 5;

        a1[5] = 6; //array index out of bouds exception

        System.out.println(a1[0] );
        System.out.println(a1[1] );
        System.out.println(a1[2] );
        System.out.println(a1[3] );
        System.out.println(a1[4] );
```

```
System.out.println(a1[5] );// ArrayIndexOutOfBoundsException: Index 5 out of bounds for length 5

    }
}
```

DEFAULT VALUES OF ARRAY

Datatype	Default values
Int	0
Char	Void space
Float	0.0
Double	0.0
String	null

ANOTHER WAY TO INTIALIZE AND DECLARE THE ARRAY

1. Int a[] = new int[5]

   a[] ={1,2,3,4,5};

2. Int a[] = new int[]{1,2,3,4,5};

   Char a[] = new[]{'a','b','c','d','e'};

HOW TO FIND LENGTH OF ARRAY

- LENGTH : LENGTH IS A KEYWORD USED TO GET THE LENGTH OF AN ARRAY DURING RUN TIME

  SYNTAX : ARRAY_NAME.LENGTH;

- IF YOU WANT TO DECLARE ARRAY AND SPECIFY SIZE IN SAME LINE
  - DATA TYPE [] ARRAY_NAME = NEW DATA TYPE[SIZE]

  int [] intArray = new int[6];

  Int size = intArray.length;