8   COMPUTER PROGRAMMING

ARRAY,

CALLING METHOD and RETURN

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□ **CALLING METHOD AND RETURN**

ARRAY

- ☐ **A DATA STRUCTURE for storing a same type of data**

- ☐ **A container object that holds a fixed number of values of a single type**
- ☐ **The length of an array is established when the array is created.**

- ☐ **After creation, its length is fixed.**

- ☐ **Dealing with array as object**
  - ■ Declaring an array object and then creating an object to it and use it

ARRAY

□ **Declaring one dimension array and initializing it**

- *type array-name[ ] ;*
- *type[ ] array-name ;*

□ **Declaring multiple dimension array and initializing it**

- *type array-name[ ][ ];*
- *type[ ][ ] array-name;*

□ **Creating array object**

- array-name = new type[size];

☐ One dimension array

```java
class exArray{
  public static void main(String args[ ]) {
    int month[] = new int[12];
    month[0] = 31;
    month[1] = 28;
    month[2] = 31;
    month[3] = 30;
    month[4] = 31;
    month[5] = 30;
    month[6] = 31;
    month[7] = 31;
    month[8] = 30;
    month[9] = 31;
    month[10] = 30;
    month[11] = 31;

    for(int i = 0; i < 12; i++) {
      System.out.println( "배열 month[ "+ i +" ]방인 "+(i+1)+" 월은 "+ month[i] +
"일입니다." );
    }
  }
}
```

Example 1 FOR ARRAY

☐ **Print out days according to digit typed by users using FOR statement to the following.**

```
1  class Array {
2    public static void main(String args[]) {
3      String weekly_days[] = new String[7];
4
5      weekly_days[0] = "월요일";
6      weekly_days[1] = "화요일";
7      weekly_days[2] = "수요일";
8      weekly_days[3] = "목요일";
9      weekly_days[4] = "금요일";
10     weekly_days[5] = "토요일";
11     weekly_days[6] = "일요일";
12
13   System.out.println("제일 좋아하는 요일은 " + weekly_days[5] + " 입니다.");
14   }
15 }
```
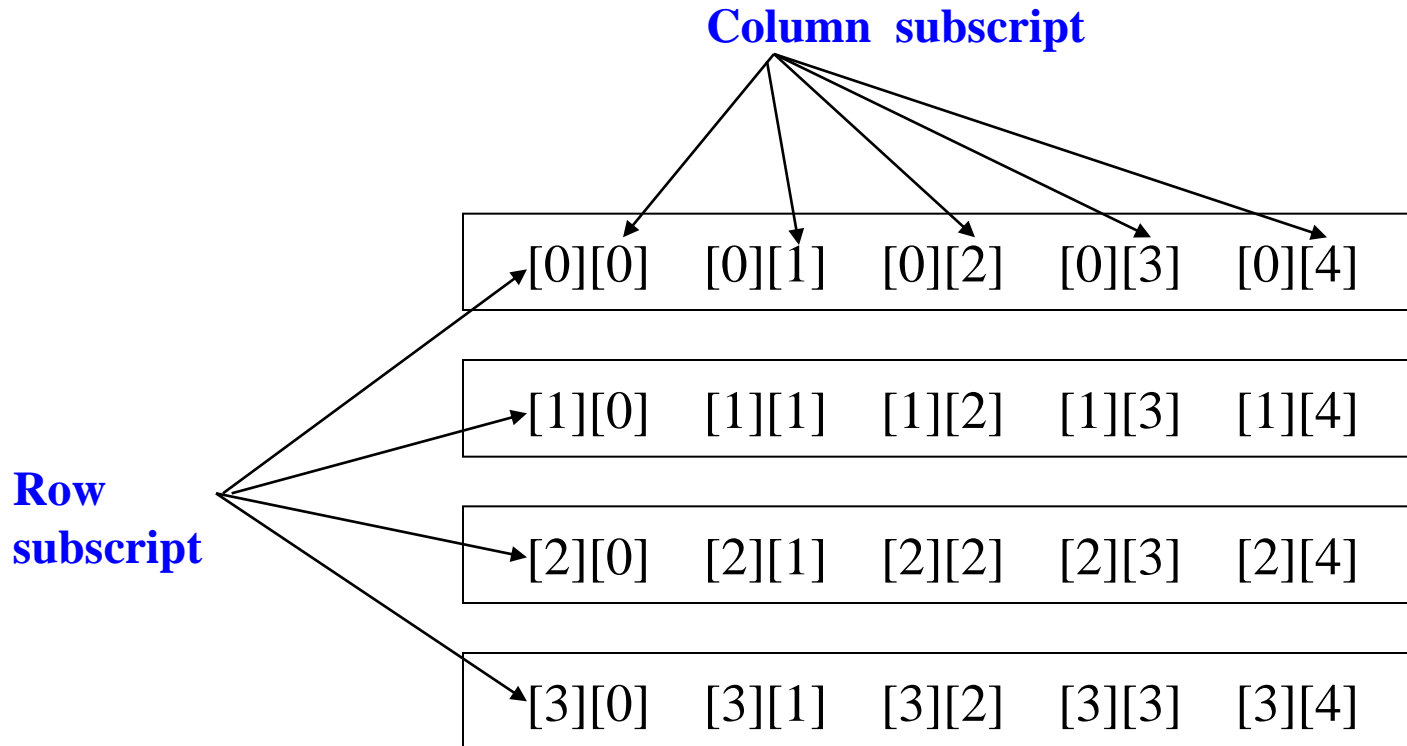
Example 2 FOR ARRAY

```
1  class AutoArray {
2    public static void main(String args[]) {
3    String weekly_days[] = {"월요일","화요일","수요일","목요일","금요일","토요일","일요일"};
4    System.out.println("제일 좋아하는 요일은 " + weekly_days[5] + " 입니다.");
5    }
6  }
```

ARRAY SUBSCRIPT

☐ **Two dimension array**

Ex) two dimension array with 20 elements

int two_ dimension[ ][ ] = new int[4][5];

Column subscript

[0][0]	[0][1]	[0][2]	[0][3]	[0][4]

[1][0]	[1][1]	[1][2]	[1][3]	[1][4]

Row subscript

[2][0]	[2][1]	[2][2]	[2][3]	[2][4]

[3][0]	[3][1]	[3][2]	[3][3]	[3][4]

Example 3 FOR ARRAY

```java
1  class TwoArray {
2    public static void main(String args[]) {
3      int two_array[][]= new int[4][5];
4      int i, j, k = 0;
5
6      for(i=0; i<4; i++)
7        for(j=0; j<5; j++) {
8          two_array[i][j] = k;
9          k++;
10         }
11
12     for(i=0; i<4; i++) {
13       for(j=0; j<5; j++)
14         System.out.print(two_array[i][j] + " ");
15       System.out.println();
16     }
17   }
18 }
```

Example 4 FOR ARRAY

```java
1  class TwoDA {
2    public static void main(String args[]) {
3      int twoD[][] = new int[4][];
4      twoD[0] = new int[1];
5      twoD[1] = new int[2];
6      twoD[2] = new int[3];
7      twoD[3] = new int[4];
8
9      int i, j, k = 0;
10
11     for(i=0 ; i<4 ; i++)
12       for(j=0 ; j<i+1 ; j++) {
13         twoD[i][j] = k;
14         k++;
15       }
16
17     for(i=0 ; i<4 ; i++) {
18       for(j=0 ; j<i+1 ; j++)
19         System.out.print(twoD[i][j] + " ");
20       System.out.println();
21     }
22   }
23 }
```

Make a program to get an average after typing in 5 digits

■ Example assigned an input data to a character
  ➢ **char choice = (char) System.in.read() ;**

■ Example changed an input string into an integer

  ➢ **int x = Integer.parseInt(System.in.read());**

Example 5 FOR ARRAY

```java
 1  class TwoDA1{
 2      public static void main(String args[]){
 3          int twoDarray[][] = {
 4                  {12, 34, 56},
 5      {23, 45, 67, 89},
 6      {123, 456}
 7        };
 8       for (int i=0; i<3; i++)
 9        System.out.println("twoDarray[" + i + "]열의 길이는 " + twoDarray[i].length + "이다.");
10      }
11  }
```

Example 6 FOR ARRAY

```
1  class ThreeDA {
2    public static void main(String args[]) {
3      int threeD[][][] = new int[3][4][5];
4      int i, j, k;
5
6      for(i=0; i<3; i++)
7        for(j=0; j<4; j++)
8          for(k=0; k<5; k++)
9          threeD[i][j][k] = i;
10
11     for(i=0; i<3; i++) {
12       System.out.println((i+1) + "번째 2 차원 배열 ");
13       for(j=0; j<4; j++) {
14         for(k=0; k<5; k++)
15           System.out.print(threeD[i][j][k] + " ");
16         System.out.println();
17       }
18       System.out.println();
19     }
20   }
21 }
```

☐ Method

- ■ A small program unit to handle commands for a specific function
- ■ A method corresponds to a message that the object responds to

☐ User defined method creation

- ■ Users make and use methods directly
- ■ Format

  - ➢ **Type Method_Name(parameter_list)**
    ```
    {
        variable_declaration;
        processing_statements;
        return ( result_value );
    }
    ```

☐ case

```
class exMethod{

  static void call_func( ) {
    System.out.println(" Hello World ");
  }

  public static void main(String args[ ]) {
    call_func( );
  }
}
```

```
Type  Method_Name( parameter_list )
  {
      variable_declaration;
      processing_statements;
      return ( result_value );
  }
```

☐ How to pass on data to a method

■ Calling method adding from 1 to 10

```java
class exAddMethod{

  static int call_add_func( int n ) {
    int i;
    int sum = 0;
    for( i=1; i <= n; i++ )
    {    sum += i;   }

    System.out.println("호출된 메소드에서 1~" +
                        n + " 까지 합 : " + sum);

     return ( sum );
  }

  public static void main(String args[ ]) {
    int total = call_add_func( 10 );     // n = 10
일때
    System.out.println("Main 합계: "+ total);
  }
}
```

```
Type  Method_Name( parameter_list )

  {
    variable_declaration;
    processing_statements;
    return ( result_value );
  }
```

METHOD AND JAVA

□ practice : How to pass on data to a method

- ■ Making a program to get an average value from digit numbers that user types in

    (typing in digit numbers in main( ) method,

       and then, passing on that numbers as argument values,

         processing to get an average value in subfunction( ))

CONCLUDE

□ **ARRAY**

■ ARRAY FORMAT

■ SUBSCRIPT OF ARRAY

■ One DIMENSION ARRAY

■ Two DIMENSION ARRAY

□ **CALLING METHOD AND RETURN**