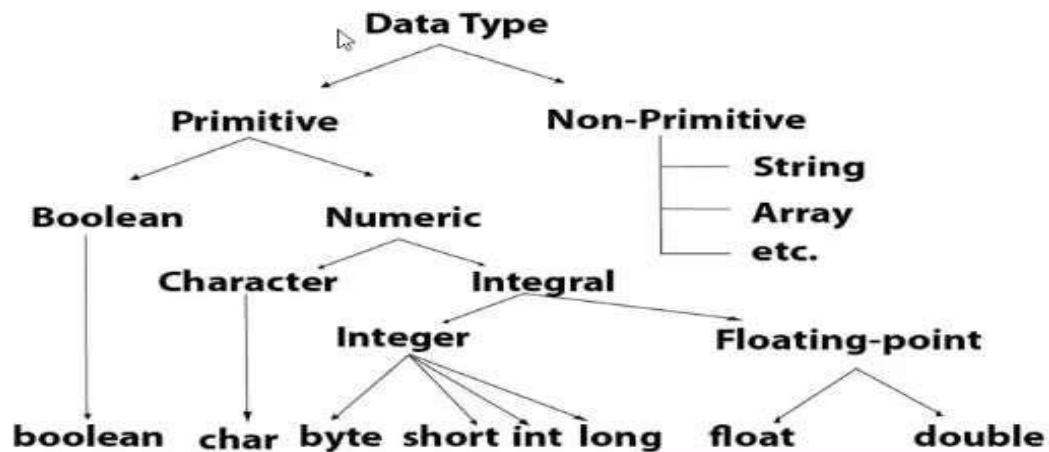


Basics

We use the static void main bcoz it is a starting point as it's a void main, but static we use bcoz, Whichever class is static class javac loads those into memories.

We use "**System.out.print();**" bcoz in java there is a outstream file which has print commands. Use "**System.out.println("hello");**" --> like "**(hello\n)**" so every time it prints hello, compiler goes to next line.

DATA TYPES:



Data Type	Default Value	Default size
boolean	false	1 bit
char	'\u0000'	2 byte
byte	0	1 byte
short	0	2 byte
int	0	4 byte
long	0L	8 byte
float	0.0f	4 byte
double	0.0d	8 byte

Range of numeric data types in Java

Type	Size	Range
byte	8 bits	-128 .. 127
short	16 bits	-32,768 .. 32,767
int	32 bits	-2,147,483,648 .. 2,147,483,647
long	64 bits	-9,223,372,036,854,775,808 .. 9,223,372,036,854,775,807
float	32 bits	$3.40282347 \times 10^{38}$, $1.40239846 \times 10^{-45}$
double	64 bits	$1.7976931348623157 \times 10^{308}$, $4.9406564584124654 \times 10^{-324}$

```

public class Hello{
    public static void main(String ar[]){
        int a= 10;
        int b = 20;
        int c = 30;
        if(a>b){
            if(a>c){
                System.out.println(a);
            }else{
                System.out.println(c);
            }
        }else if(b>c){
            System.out.println(b);
        }else{
            System.out.println(c);
        }
    }
}

```

do-while loop is a exit control loop bcoz it will first do the operation and then check the condition.

While loop is entry control loop

For loop is entry control loop

Prime number

```

public class PrimeExample{
    public static void main(String
    args[]){ int i,m=0,f=0;
    int
    n=3;
    m=n/2;
    if(n==0||n==1){
        System.out.println(n+" is not prime number");
    }else{
        for(i=2;i<=m;i+
        +){ if(n%i==0){
            System.out.println(n+" is not prime
            number"); f=1;
            break;
        }
        }
        if(f==0) { System.out.println(n+" is prime number"); }
    }
}

```

```
}  
}
```

```
3 is prime number  
|
```

Fibonacci

series.

```
public  
class fibo{  
    public static void main(String  
        ar[]){ int a = 0;  
        int b =  
        1; int c;  
        System.out.println(  
        a);  
        System.out.println(  
        b); for( int i = 0 ; i <  
        8 ; ++i)  
        {  
            c = a + b;  
            System.out.println(  
            c); a = b;  
            b = c;  
        }  
    }  
}
```

```
0  
1  
1  
2  
3  
5  
8  
13  
21  
34
```

Factorial of a


number

```
public  
class fact{  
    public static void main(String  
        ar[]){ int n = 10;  
        int fact = 1;  
        for( int i = 1 ; i < n ; i  
            ++ ){ fact = fact *  
            i;  
        }  
        System.out.print(fact);  
    }  
}
```

```
362880|
```

Armstrong number For e.g. 153: $1*1*1 + 5*5*5 + 3*3*3 =$


```
153 public class arm{
    public static void main(String
        ar[]){ int a = 153;
        int a1 = a;
        double
        sum;
        for( sum = 0 ; a != 0 ;
            a/=10){ int m = a % 10;
            double num =
            Math.pow(m,3); sum = sum
            + num;
        }
        if(sum == a1){
            System.out.print(a1 + " is Armstrong Number"); }
    }
}
```



```
153 is Armstrong Number|
```

Sum of digits

```
public class
sum{
    public static void main(String
        ar[]){ int a = 154;
        int sum;
        for( sum = 0 ; a != 0 ;
            a/=10){ int m = a % 10;
            sum = sum + m;
        }
        System.out.println("Sum of digits is "+sum);
    }
}
```



```
Sum of digits is 10
|
```

```
public class pattern2{
    public static void main(String
        ar[]){ for( int i = 0 ; i <= 10
        ; i ++){
        for(int j = 1 ; j <= i; j++){
            System.out.print(j+"
            ");
        }
        System.out.println(" ");
    }
}
```

```

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

```

```

public class pattern1{
    public static void main(String
        ar[]){ for(int i = 1 ; i <=10 ;
        i ++){
        for(int j = 1 ; j <= i ; j ++){
            System.out.print("
            "+1);
        }
        System.out.println(" ");
    }
}

```

```

1
1 1
1 1 1
1 1 1 1
1 1 1 1 1
1 1 1 1 1 1
1 1 1 1 1 1 1
1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1

```

There are many types of operators in Java which are given below:

- Unary Operator,
- Arithmetic Operator,
- Shift Operator,
- Relational Operator,
- Bitwise Operator,
- Logical Operator,
- Ternary Operator and
- Assignment Operator.

There are many types of operators in JAVA

1.Unary Operator

2.Arithmetic

Operator

3.Shift Operator

If **x=10**, then calculate **x>>2** value.

Shifting the value of x towards the right two positions will make the rightmost 2 bits to be lost. The value of x is 10. The binary representation of **10** is **00001010**. The procedure to do right shift explained in the following example:

Observe the above example, after shifting the bits to the right the binary number **00001010** (in decimal 10) becomes **00000010** (in decimal 2).

or left side (**<<** it adds the 0 at the left side)

TRIPLE RIGHT SHIFT

When we apply >>> on a **positive number**, it gives the same output as that of >>. It gives a positive number when we apply >>> on a negative number. MSB is replaced by a 0. Observe the above example, after shifting the bits to the right the binary number **00100000** (in decimal 32) becomes **00000100** (in decimal 4). The last three bits shifted out and lost.

4.Relational Operator

5.Bitwise Operator (Is same as truth table)

& For e.g.: (10&4) --> 1010 & 0100 --> 0000 --> 0

| For e.g.: (10|4) --> 1010 | 0100 --> 1110 --> 12

^ EXOR for e.g. (10^7) --> 1010 ^ 0111 --> 1101 --> 13

6.Logical Operator

&& if both condition is true then only it throughs true

|| if any of the condition is true then only it throughs true

7.Ternary Operator

?(if true then); :(if false then)

Condition1?print this : print this

8.Assignment Operator

-----SWITCH CASE-----

Switch(condition

n){ Case 1:

SOP(Expression

1); break;

Case2:

SOP(Expression

1); break;

Case3:

SOP(Expression

1); break;

Default:

SOP(Expression

1); break;

}

```
char a='A';
switch(a){
    case 'A' | 'a' | 'E' | 'e' | 'I' | 'i' | 'O' | 'o' | 'U' | 'u':
        System.out.println("Vowel");
    default:
        System.out.println("Not Vowel");
}
```

-----ARRAY-----

int a[] = new int[10]; //declaring an

array a[0] = 10; /* initializing the an

array*/ a[1] = 13;

a[2] = 15;

a[3] = 7;

System.out.print(a[0]);

System.out.print(a.length); //to print the length of an array.

```

coder@ubuntu:~/Desktop/Java Class$ java Hello
A [0] = 10
A [1] = 5
A [2] = 9
A [3] = 0
A [4] = 0
A [5] = 0
A [6] = 0
A [7] = 0
A [8] = 0
A [9] = 0
coder@ubuntu:~/Desktop/Java Class$

```

Import `java.util.Scanner`; // to import scanner

`Scanner cin = new Scanner(System.in);` // we have to create object to use scanner from Scanner package `system.in` stands for system input stream which is again package of java present in `java.lang`

```

import java.util.Scanner;

public class Hello{
    public static void main(String ar[]){
        Scanner cin = new Scanner(System.in);
        System.out.println("Enter a Number");
        int a = cin.nextInt();
        System.out.println("You Entered " + a);
    }
}

```

To read float Input.

```

import java.util.Scanner;

public class Hello{
    public static void main(String ar[]){
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a Float Number");
        float a = scan.nextFloat();
        System.out.println("You Entered " + a);
    }
}

```

To read String Input:

```

import java.util.Scanner;

public class Hello{
    public static void main(String ar[]){
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a character");
        String a = scan.nextLine();
        System.out.println("You Entered " + a);
    }
}

```

Taking Input in array ;

```

import java.util.Scanner;

public class Hello{
    public static void main(String ar[]){
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter size of array");
        int size=scan.nextInt();
        int array[] = new int[size];
        System.out.println("Enter " + size + " element");
        for (int i =0 ; i< size; i++){
            array[i] = scan.nextInt();
        }
        for (int i =0 ; i< size; i++){
            System.out.println("Array [" +i+"] = " + array[i]);
        }
    }
}

```

```

I am Boy.
You Entered I am Boy.
coder@ubuntu:~/Desktop/Java
coder@ubuntu:~/Desktop/Java
Enter a Name
I am boy.
You Entered I
coder@ubuntu:~/Desktop/Java
Enter a Name
Amit Dash
You Entered Amit
coder@ubuntu:~/Desktop/Java
coder@ubuntu:~/Desktop/Java
Enter size of array
6
Enter 6 elements of Array
5 9 10 55 77 46
Array [0] = 5
Array [1] = 9
Array [2] = 10
Array [3] = 55
Array [4] = 77
Array [5] = 46
coder@ubuntu:~/Desktop/Java

```


-----2-D ARRAY-----

```
import java.util.Scanner;

public class Hello{
    public static void main(String ar[]){
        Scanner scan = new Scanner(System.in);
        int a[][] = new int[3][3];
        int b[][] = {{1,2,3},{4,5,6},{7,8,9}};
        for(int i=0; i<3; i++){
            for(int j=0; j<3; j++){
                a[i][j]=scan.nextInt();
            }
        }

        for(int i=0; i<3; i++){
            for(int j=0; j<3; j++){
                System.out.print(a[i][j] + " ");
            }
            System.out.println();
        }

        for(int i=0; i<3; i++){
            for(int j=0; j<3; j++){
                System.out.print(b[i][j] + " ");
            }
            System.out.println();
        }
    }
}

/*
a00 a01 a02
a10 a11 a12
a20 a21 a22
*/
```

OUTPUT:

```
coder@ubuntu:~/Desktop/Java Class$ java Hello
9 8 7 6 5 4 3 2 1
9 8 7
6 5 4
3 2 1
-----
1 2 3
4 5 6
7 8 9
coder@ubuntu:~/Desktop/Java Class$
```

Below is called as **TYPE CASTING**, basically assigning value to sum/size in our case.

```
System.out.println("Avg = "+float(sum/size));
```

-----FUNCTIONS-----

Creating a function called sum.

```
import java.util.Scanner;

public class Hello{

    public void sum (){
        int a=10,b=20,c;
        c=a+b;
        System.out.println("Sum = "+c);
    }

    public static void main(String ar[]){
        Hello h = new Hello();
        h.sum();
    }
}
```

```
coder@ubuntu:~/Desktop/Java Class$ java Hello
Sum = 30
coder@ubuntu:~/Desktop/Java Class$ java Hello
```

```

1 import java.util.Scanner;
2
3 public class Hello{
4     int a,b;
5     public void sum (){
6         System.out.println(a+" "+b);
7     }
8     public void sum(int a, int b){
9         System.out.println(a+b);
10    }
11    public static void main(String ar[]){
12        Hello h = new Hello();
13        h.sum();
14        Scanner s = new Scanner(System.in);
15        int n1 = s.nextInt();
16        int n2 = s.nextInt();
17        h.sum(n1,n2);
18    }
19 }

```

Four different type of function:

```

import java.util.Scanner;

public class Hello{

    public void sum1(){
        int a=20,b=10;
        System.out.println(a+b);
    }
    public int sum2(){
        int a=20,b=10;
        return (a+b);
    }
    public void sum3(int a, int b){
        System.out.println(a+b);
    }
    public int sum4(int a, int b){
        return (a+b);
    }
    public static void main(String ar[]){
        Hello h = new Hello();
        Scanner s = new Scanner(System.in);
        int n1 = s.nextInt();
        int n2 = s.nextInt();
        h.sum1();
        h.sum3(n1,n2);
        System.out.println(h.sum2());
        System.out.println(h.sum4(2,3));
    }
}

```

```

coder@ubuntu: ~/Desktop/Java CL
5 6
11
coder@ubuntu:~/Desktop/Java Class$ javac Hello.java
Hello.java:12: error: method sum() is already defined
    public int sum(){
            ^
Hello.java:16: error: method sum(int,int) is already
    public int sum(int a, int b){
            ^
Hello.java:26: error: 'void' type not allowed here
        System.out.println(h.sum());
                        ^
Hello.java:27: error: 'void' type not allowed here
        System.out.println(h.sum(2,3));
                        ^
4 errors
coder@ubuntu:~/Desktop/Java Class$ javac Hello.java
coder@ubuntu:~/Desktop/Java Class$ java Hello
2 6
30
8
30
5
coder@ubuntu:~/Desktop/Java Class$

```

OVERRIDING (In below case we have 4 function every function has same name but different type of parameter and number of parameter.)

```

import java.util.Scanner;

public class Hello{

    public void sum(int a, int b){
        System.out.println(a+b);
    }
    public void sum(int a, int b, int c){
        System.out.println(a+b+c);
    }
    public void sum(float a, float b){
        System.out.println(a+b);
    }
    public void sum(float a, float b, float c){
        System.out.println(a+b+c);
    }
    public void sum(int a, float b){
        System.out.println(a+b);
    }
    public void sum(float a, int b){
        System.out.println(a+b);
    }
    public static void main(String ar[]){
        Hello h = new Hello();
        Scanner s = new Scanner(System.in);
        int n1 = s.nextInt();
        int n2 = s.nextInt();*/
        h.sum(1,2);
        h.sum(1,2,3);
        h.sum(1.0f,2.0f);
        h.sum(1.0f,2.0f,3.0f);
        h.sum(1,2.0f);
    }
}

```

OUTPUT:

```

coderguuntu:~/Desktop/Java Class$ java Hello
3
6
3.0
6.0
3.0
3.0

```

You can also use this syntax to call a function in main without creating an object name aka instance.

```

// ...
new Hello().sum(1,2);

```