

Java in One Shot

Part - 1

Flow - 1

- 1) Basic Printing, next line, printing numbers also with + and -.
- 2) Variables, printing variables, int, float, and +,-,*,/ of integers.
- 3) Variables naming rules.
- 4) Comments
- 5) Taking Input
- 6) Modulus Operator
- 7) Float to int, int to float
- 8) Hierarchy
- 9) Char and ASCII

Basic program in Java

```
public class filename{  
    public static void main(String[] args){  
        //Code  
    }  
}
```

How to move in next line?

Example :

```
System.out.print("Hello PW");
```

```
System.out.print("Hello CW");
```

Output will be :

```
Hello PWHello CW
```

Printing Numbers (what computer thinks is a number and what is a number)

"Hello" → text

Examples :

- 1) System.out.print("4"); → 4
- 2) System.out.print(4); → 4
- 3) System.out.print(4+3); → 7
- 4) System.out.print("4+3"); → 4+3

sout (Hello World);

Variables and their Declaration

Let us focus on int data type as of now.

1) Variables as containers:

```
public class variablesint {  
    public static void main(String[] args) {  
        int x; → ek dabba allot  
        integer ← x = 500;  
        System.out.println(x);  
    }  
}
```

1 GB → 1000 Mb 1 Kb = 1000 bytes
1 Mb → 1000 Kb



```
public static void main(String[] args) {  
    int x;  
    x = 500;  
    System.out.println(x);  
    x = 400; |  
    System.out.println(x);  
} x = 4;  
cout (n);
```

x
~~500~~
400

- Output
- 500
 - 400
 - 4

```
public static void main(String[] args) {  
    int x;  
    x = 500;  
    System.out.println(x);  
    x = x + 5;  
    System.out.println(x);  
}
```

Output

500

}

500
x

x = 500;

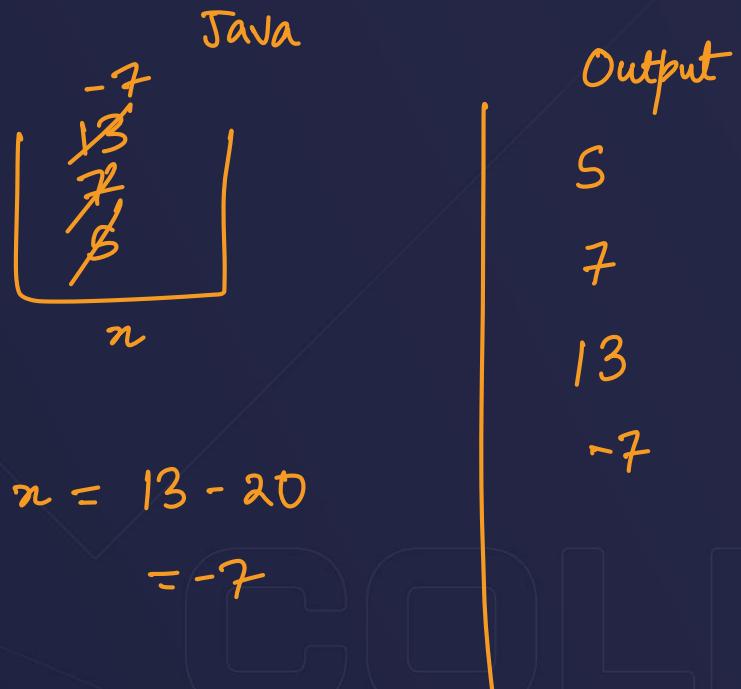
x = x + 5;

x = 500 + 5;

x = 505;

Printing Variables in C & Updation of Variables

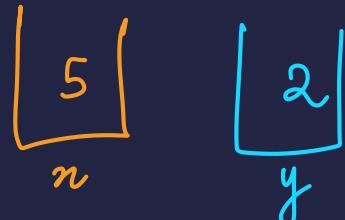
```
int x = 5;  
sout(x);  
x = 7;  
sout(x);  
x = x + 6;  
sout(x);  
x = x - 20;  
sout(x);
```



Arithmetic operations on int data type



```
int x = 5;
```



```
int y = 2;
```

```
sout(x+y);
```

sout ($5/2$);

```
sout(x-y);
```

2.5

```
sout(x*y);
```

5 → integer

```
sout(x/y);
```

2 → integer

$2 \times 1 \rightarrow$

Output

```
public static void main(String[] args) {  
    int x = 5, y = 8, z = 9;  
    System.out.println("The value of x is "+x);  
    System.out.println("The value of y is "+y);  
    z = 10;  
    z = x / y; → z = 5/8 → z=0  
    System.out.println("The value of z is "+z);  
}
```



"The value of x is 5"

Output

The value of x is 5

The value of y is 8

The value of z is 0

```
int x=5, y=8, z=10;
```

$x \rightarrow 5$

```
cout ("Hello" + x+y+z);
```

↓

"Hello" + "5" + "8" + "10"

→ "Hello5810"

```
cout ("13" + z)
```

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Increment - Decrement operators

```
int x = 5;
```

```
x++;
```

```
sout(x);
```

```
x--;
```

```
sout(x);
```

```
++x;
```

```
sout(x);
```

```
--x;
```

```
sout(x);
```

n

n

n

$x++ \rightarrow x = x + 1$

$++x \rightarrow x = x + 1$

$--x \rightarrow x = x - 1$

Output

6

5

6

5

```
public static void main(String[] args) {  
    int x = 5;  
    System.out.println(x++);  
    System.out.println(x);  
}  
}
```

Output

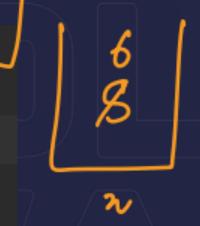
6

6



System.out.println(x++);

```
public static void main(String[] args) {  
    int x = 5;  
    System.out.println(++x); // ++x -> x = x + 1;  
    System.out.println(x);  
}  
}
```



Example : Calculate sum of 2 numbers

double data type

```
double x = 3.1;
```

→ real number

```
int y = 3;
```

|

integer

```
int x = 5;  
int y = 2;  
cout (x/y);
```

```
public class doubledatatype {  
    public static void main(String[] args) {  
        double x = 5;  
        double y = 2;  
        double z = 5 / 2; → double z = 2;  
        System.out.println(z);  
    }  
}
```

2.0
 z

Output : 2.0

```
public class doubledatatype {  
    public static void main(String[] args) {  
        double x = 5;  
        double y = 2;  
        double z = x / y;  
        System.out.println(z);  
    }  
}
```

5.0
 x

2.0
 y

2.5
 z

Output : 2.5

$$5/2 \rightarrow 2$$

$$\boxed{5.0}/\boxed{2} \rightarrow 2.5$$

$$5/2.0 \rightarrow 2.5$$

$$5.0/2.0 \rightarrow 2.5$$

Arithmetic operations on double data type

```
double x = 5;
```

```
double y = 2;
```

```
sout(x+y);
```

```
sout(x-y);
```

```
sout(x*y);
```

```
sout(x/y);
```

```
public class doubledatatype {  
    public static void main(String[] args) {  
        double x = 5;  
        double y = 2;  
        System.out.println(x+y);  
        System.out.println(x-y);  
        System.out.println(x*y);  
        System.out.println(x/y);  
    }  
}
```

$x = 5.0$ $y = 2.0$

Output

7.0

3.0

10.0

2.5

Example : Calculating percentage of 5 subjects

```
double x1 = 90; // x1 can be physics  
double x2 = 91; // x2 can be chemistry  
double x3 = 92; // x3 can be maths  
double x4 = 93; // x4 can be english  
double x5 = 94; // ohh wait comments ke baare me to bataya hi nahi  
xD  
  
double y = (x1 + x2 + x3 + x4 + x5)/5;  
sout(y);  
// change the marks and run each time
```

HW: WAP to calculate the percentage of 4 subjects of 60 marks each.

Example : Calculating Area of a Circle

```
double radius = 5;  
double pi = 3.1415;  
double area = pi*radius*radius;  
sout(area);
```

$$r = 10$$

$$\pi r^2 = 3.14 \times 10 \times 10
= 314.0$$



$$r = S$$

$$A = \frac{22}{7} \times S \times S$$

$$\rightarrow A = \pi r^2$$

$$C = 2\pi r$$

$$25 \times 3.14$$

```
public class areaOfACircle {  
    → public static void main(String[] args) {  
        → double r = 8;  
        → double pi = 3.1415;  
        → double a = pi * r * r;  
        → System.out.println(a);  
    }  
}
```

Output

201.56

8.0

3.1415

201.56

r

pi

a

HW: WAP to display/print volume of a sphere with given radius.

* Variable Naming rules

- 1) Variables can start from an alphabet or underscore _ .
- 2) Special characters except _ are not allowed.
- 3) Some particular keywords are not allowed.
- 4) Commas or blanks are not allowed.

int n, inty ,
double 2 r, a

Variable name cannot start with a number.

Variable Naming rules – Examples

Q. Which of the following are invalid variable names and why?

BASICSSALARY

_basic

basic-hra

#MEAN

group.

422

population in 2006

over time

mindovermatter

FLOAT

hELLO

queue.

team' svictory

Plot#3

2015_DDay

Example : Calculating Simple Interest

```
double p,r,t,si;  
p = 100; }  
r = 10; }  
t = 2; }  
si = (p*r*t)/100;  
cout(si);
```

$$SI = \frac{PRT}{100}$$

$$\frac{100 \times 10 \times 2}{100} = 60$$

$$100 * 10 * 2 / 100;$$

$$(100 * 10 * 2) / 100;$$

Taking input // Let us take a simple example

```
import java.util.Scanner;  
Scanner sc = new Scanner(System.in);  
int x;  
sout("Enter a number\n");  
x = sc.nextInt(); // user will give 'x' a value.  
int y = x*x;  
sout("square of number that you gave is : ");  
sout(y);
```

```
package javaInput;  
import java.util.Scanner;✓  
public class areaCirclewithInput {  
    public static void main(String[] args) {  
        ✓Scanner sc = new Scanner(System.in);✓  
        ✓System.out.print("Enter radius : ");  
        ✓int radius;  
        ✓radius = sc.nextInt();  
        ✓double pi = 3.1415;  
        ✓double area = pi * radius * radius;  
        ✓System.out.println("The area of circle is : "+area);  
    }  
}
```

10

radius

3.1415

pi

314.15

area

Output

Enter Radius : 10

The area of circle is : 314.15

HW: WAP to take input of
a number & print the
square of it.

```
package javaInput;  
import java.util.Scanner;  
public class sumOf2numbersInput {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        System.out.println("Enter first number : ");  
        int x = sc.nextInt();  
        System.out.println("Enter second number : ");  
        int y = sc.nextInt();  
        int sum = x + y;  
        System.out.println("The sum is : "+sum);  
    }  
}
```

Output

Enter first number : 10

Enter second number : 20

The sum is : 30



Taking input // SUM of 2 given numbers

Example : Take two integers input, a and b : $a > b$, and find the remainder when a is divided by b .

$$a = 5$$

$$b = 2$$

$$\begin{array}{r} 2 \rightarrow \text{quotient} \\ 2 \overline{)5} \\ \underline{-4} \\ \hline 1 \rightarrow \text{remainder} \end{array}$$

$$\frac{39}{7} = 5$$

$$\begin{array}{r} 5 \\ 7 \overline{)39} \\ \underline{-35} \\ \hline 4 \end{array}$$

$$\text{Divisor} \times \text{quotient} + \text{Remainder} = \text{Dividend}$$

C

$$\text{Remainder} = \text{dividend} - \text{divisor} \times \text{quotient}$$

$$a \quad b \quad q$$

$$\Rightarrow r = a - b^* q$$

Operators :

$+$, $-$, $*$, $/$, $\%$



remainder



int

$a + b$

$a - b$

$a * b$

a / b

$a \% b$

Hierarchy of operators

```
int i = 2 * 3 / 4 + 7 / 4 + 8 - 2 + 5 / 8 ;
```

sout(i); $\frac{6}{4}$ ↓
 $1 + 1 + 8 - 2 + 0$; = 8

BODMAS → brackets order division multiplication add sub

↓

1) Brackets

2) Order

3) Div/Multi

4) Add/Sub

Maths

$$\underbrace{2^* 3 / 4} = 6/4 = 1.5$$

$$2^* \underbrace{3/4} = 2^* 0.75 = 1.5$$

Java (int)

$$\underbrace{2^* 3 / 4} = 6/4 = 1$$

$$2^* \underbrace{3/4} = 2^* 0 = 0$$

Try This!

Predict the output :

```
psvm(String[] args){
```

✓ int i = 2, j = 3, k, l;

✓ double a, b;

✓ k = i / j * j ; $\rightarrow (2/3) * 3 \rightarrow a$

✓ l = j / i * i; $(3/2) * 2 = 2 \rightarrow b$

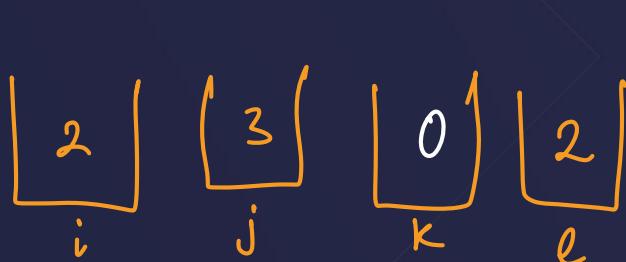
✓ a = i / j * j ; $0 * 3 = 0$

✓ b = j / i * i;

```
sout(k+" "+l+" "+a+" "+b);
```

}

C-W → Code



Output

0 2 0.0 2.0



$$a = \frac{2}{3} * 3 \\ 0.6 * 3$$

char data type

```
char ch = 'a';
```

{

character

int , double
+ integer → real no.

ASCII values

```
char ch = 'a';
```

a → 97

b → 98

c → 99

d → 100

⋮
⋮
⋮

x → 120

y → 121

z → 122

A → 65

B → 66

C → 67

⋮
⋮
⋮

X → 88

Y → 89

Z → 90

MCQ Time !

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MCQ 1

Which of the following is NOT a character constant

- (1) 'Thank You'
- (2) 'Enter values of P, N, R'
- (3) '23.56E-03'
- (4) All the above

MCQ 2

In int b = 6.6 / a + 2 * n ; which operation will be performed first?

- (1) ~~6.6 / a~~
- (2) a + 2
- (3) 2 * n
- (4) Depends upon compiler

MCQ 4

If a is an integer variable, a = 5 / 2; will return a value

- (1) 2.5
- (2) 3
- (3) 2
- (4) 0

```
int a;  
a = 5/2;
```

MCQ 5

The expression, double a = 7 / 22 * (3.14 + 2) * 3 / 5 ; evaluates to

- (1) 8.28
- (2) 6.28
- (3) 3.14
- (4) 0

$$\begin{aligned} & \Rightarrow 7/22 * 5.14 * 3/5 \\ & \Rightarrow 0 * 5.14 * 3/5 \Rightarrow 0 \\ & \Rightarrow 0 * 3/5 \\ & \Rightarrow 0/5 \Rightarrow 0 \end{aligned}$$

$$\begin{aligned} 5.0 / 2 & \rightarrow \text{int} \\ \downarrow \text{double} & \\ \end{aligned}$$

$$= 2.5$$

MCQ 7

Brackets

Order

%, *, /

+, -

The expression `int x = 4 + 2 % - 8` evaluates to

(1) -6

(2) 6

$$2 \% - 8 = 2 \% 8 = 2$$

(3) 4

$$\text{int } n = 4 + 2 = 6$$

(4) None of the above

MODULUS OPERATOR :

$$39 \% 7 = 4$$

$$4 \% 2 = 0$$

$$7 \% 39 = 7$$

$$5 \% 6 = 5$$

* $b \% a = b$ [where $b < a$]

* $a \% -b = a \% b$

$$a \% b \rightarrow b \lceil a$$

Y

MCQ 8

What will be the value of d if d is a double after the operation

$d = 2 / 7.0; ?$

- (1) 0
- (2) 0.2857
- (3) Cannot be determined
- (4) None of the above

double d;
d = 2/7.0;

$$2/7 = 0$$

d =

$$\begin{array}{r} 2 \longdiv{2.0} \\ 1.4 \\ \hline 60 \end{array}$$

10.28