

Day-1

Java

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Date	1/1/2023

Flowcharts

Graphical Representation of flow of program.

① Small parts



② Logically Arrange

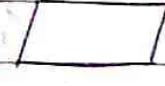
Start - Exit



Process



I/p - O/p



Decision



Arrows



## Sum of 2 Numbers

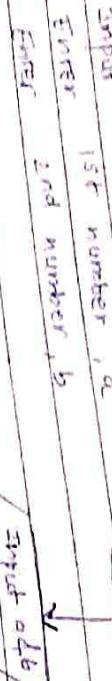
Calculate simple Interest



Input  
Principal - P  
Rate of Interest - R  
No. of yrs - N  
Time - T

Interest

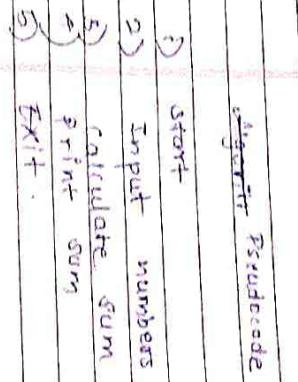
SI =  $(P \times R \times N) / 100$



Input  
Principal - P  
Rate of Interest - R  
No. of yrs - N  
Time - T

Interest

SI =  $(P \times R \times N) / 100$

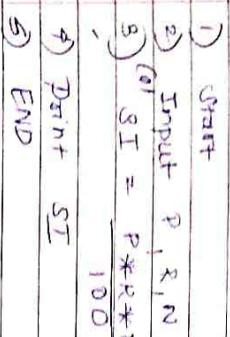


Input  
Principal - P  
Rate of Interest - R  
No. of yrs - N  
Time - T

Interest

SI =  $(P \times R \times N) / 100$

Compound Interest -



Input  
Principal - P  
Rate of Interest - R  
No. of yrs - N  
Time - T

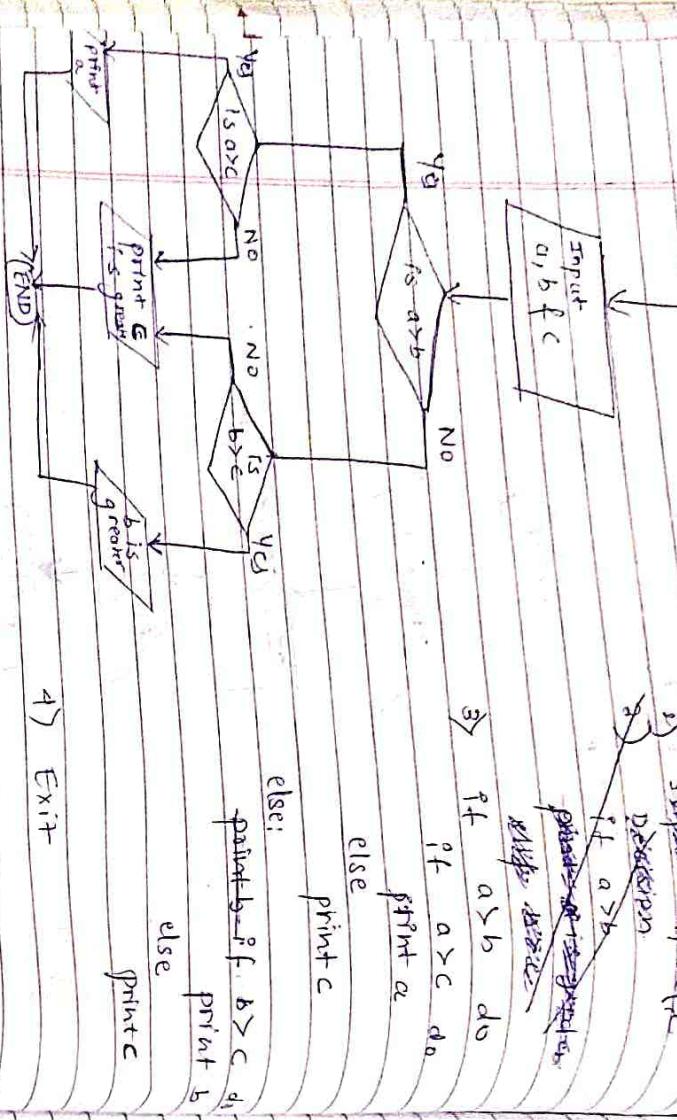
Interest

SI =  $(P \times R \times N) / 100$

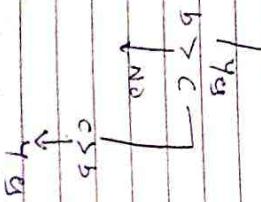
Find max of 3 numbers

Pseudo

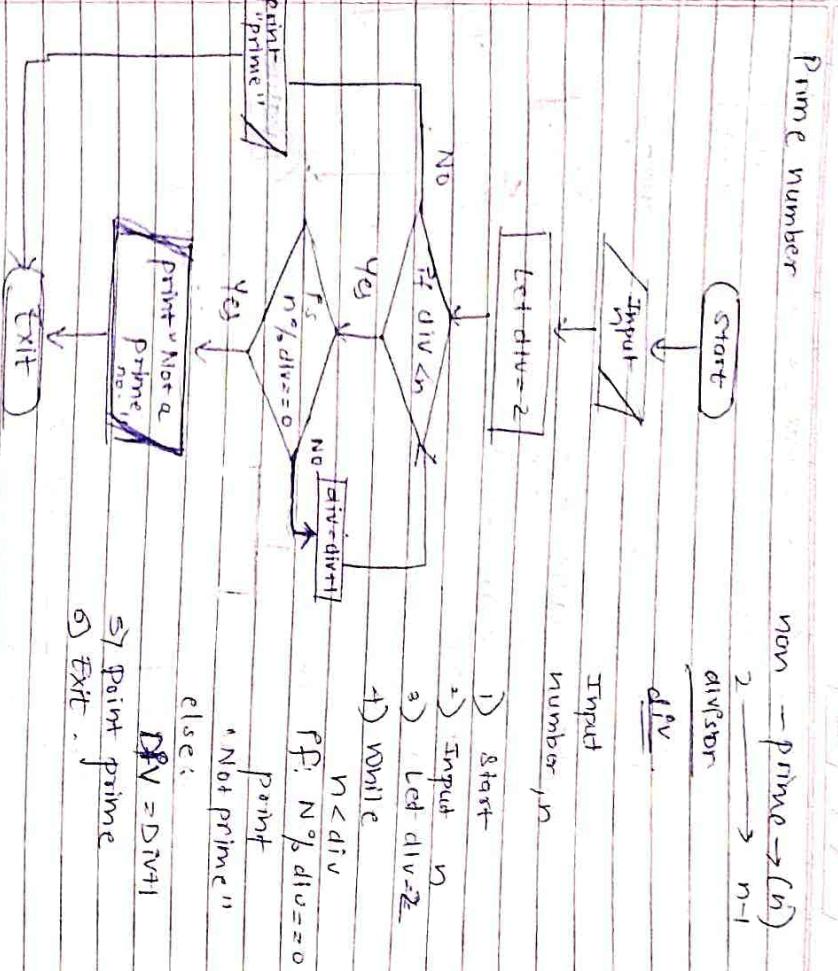
```
(start)
    1) Start
    2) Input abc
    3) if a > b
        a > b
    4) if a > c
        a > c
    5) print a
    6) else
        print c
    7) else
        print b
    8) End
```



$a = 10, b = 15, c = 20$



Prime number  
 $n \rightarrow \text{prime} \rightarrow (n)$   
 $n \rightarrow \text{div} \rightarrow n-1$   
 logic  
 $\text{div} = n$   
 value  $\neq n$   
 because prime no. is divisible

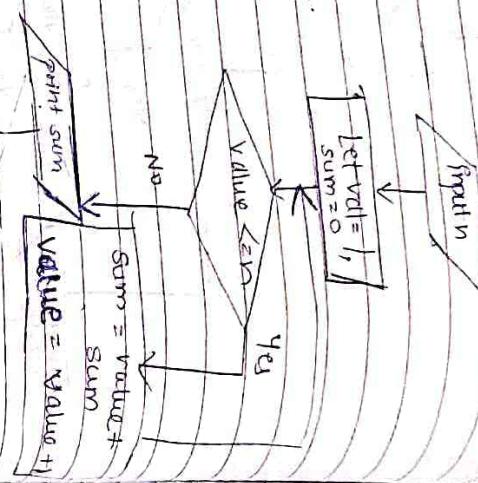


sum of first n natural numbers

flowchart

Pseudo code

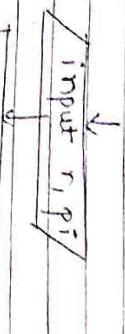
- 1) Start
- 2) Input value 1
- 3) Let value = 0
- 4) While value < n do
  - sum = sum + value.
  - value = value + 1
- 5) Print sum.
- 6) Exit



flowchart to calculate area of circle



- 1) Start
- 2) Input r, pi = 3.14
- 3) area = pi \* r \* r
- 4) Print area
- 5) Exit

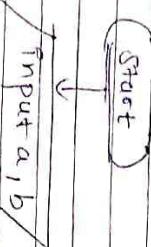


2) flowchart for greatest of 2 numbers

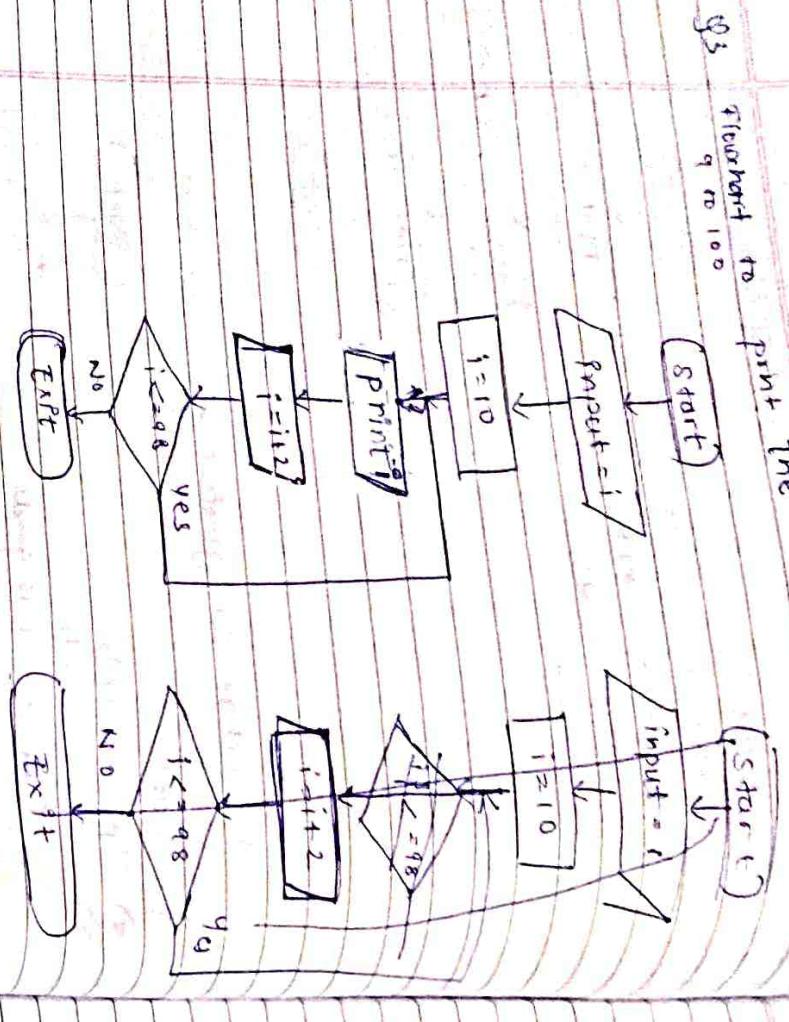
Start

- 1) Start
- 2) Input a & b
- 3) If a > b

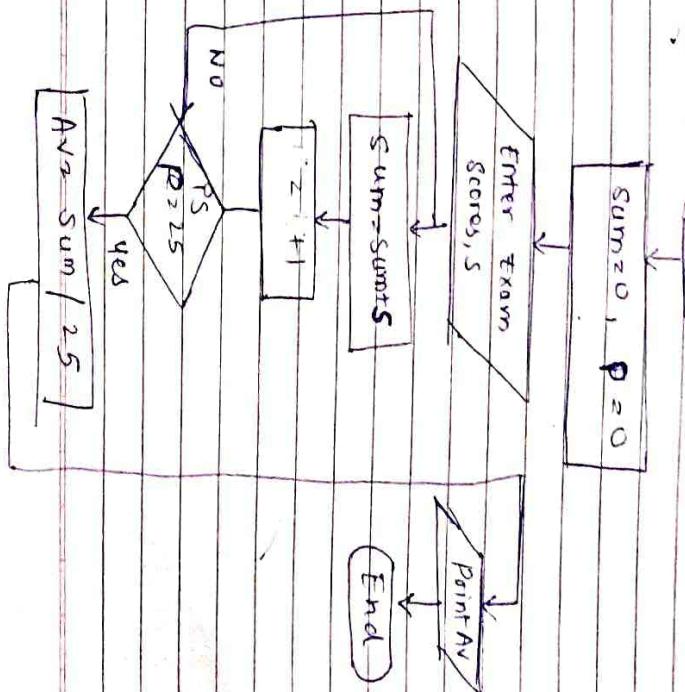
print a is greatest.



Even numbers between 100 and 1000



Avg of 25 exam scores



Pseudo code

Start

a) Input

sum=0 p>0

b) Enter from scores S

sum + sum+s

c) sum = sum+p

d) p = p+1

e) While c>25

f) do

g) Av=Sum/25

h) If c>25

i) Point Av=Sum/25

j) Else go to step 3

k) Print Avg

l) Exit

m) ax<sup>2</sup>+bx+c=0 — Posts

n) 57

o) 100

p) 5

q) a,b,c =

r) Java Basics

s) main, print, println

Output in Java

System.out.print("Hello world");

Statement

public class MainJava

{ static void main (String [ ] args) {

Variables in Java

2 \* (a+b)

Variables

Letters —

int a, b, c

Character Literal.

'a', 'b', '@', '\*'

variable

char

character literal.

int a = 100;

int b = 5;

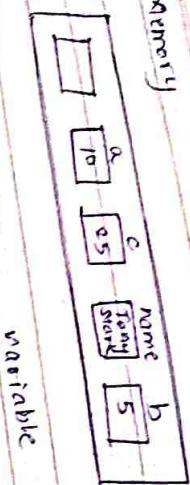
a,b,c =

Java Basics

main, print, println



variable bananato ty  
memory made  
tyasamr el jag a fagget jaggala  
create hot and tyu dila jatta  
variable alia



long is used for big data showing  
size of integer

size of Data Types  
byte 1 byte  
short 2 bytes  
char 2 bytes  
boolean 1 byte  
int 4 bytes  
long 8 bytes

How many nos & consecutive  
[-128 to 127] = 256

Data Types

Non primitive

boolean true false

int 4 bytes - 2 B + 2 B

long 8 bytes

float 4 bytes  
double 8 bytes

sum of int



data type

## Comments in Java

### 1st method

// in there!

Input in Java.

next

nextLine

nextInt

nextByte

nextFloat

nextDouble

nextBoolean

nextShort

nextLong

We make object of scanner class

package import java.util.\*;

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

Scanner sc = new Scanner (System.in)

many  
 classes

class String input = sc. next ()

gathered.

to make

object function

one package:

with the help of

function

object gets ~~tree~~

captures ~~the~~ "input"  
2 strings in "input"

System.out.println (input);

### Work of Scanner class

Because object uses the different functions different data types no capture name our ~~key~~ variable re-uses same name

### Variable

Variable is a

"name given to memory" "name given to location" that is used to hold entry in a program.

value,

The name given to a

variable function, class, structure, code in the source

is in the source is an identifier.

(3)

A variable is a name associated with the memory cell whose value can be changed in a program

more in the identifier as compared to a variable.

### Keyword

Identifier

1) An Identifier name can have alphabets, digits, underscores

2) can't start with digit

3) Keyword can't be used as a variable name

maximum length of identifier not set.

If we use `next` as it is in `println`,  
if we pass input given in actual "input",  
it will not be displayed

for eg:

Input given Tony Stark  
O/p → Tony [missing]

For this  
String name = sc.nextLine();  
System.out.println(name);  
Where Input

3

product of a\*b;

```
import java.util.*;
public class Java{
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        int sum = a+b;
        System.out.println (sum);
    }
}
```

sum of a & b

Conversion possible but not no. to another type

for e.g. int → string  
float → int

long b = a;  
destination source type

widening conversion

Implicit

\* Type conversion happens when:

a) type compatible > source type.

b) destination type > long → downcast

foreign

int number = sc.nextFloat();

int error  
is not possible  
assignment

float number = sc.nextFloat();

System.out.println(number);

```
import java.util.Scanner (System.in);
Scanner sc = new Scanner ( );
int r = sc.nextInt();
int a = r*3.14f;
```

float floatArea =

```
float floatArea;
scout (area);
```

o/p error  
int a = 25  
long b = a  
scout (b);  
o/p 25  
Because small datatype is  
space can be

Type casting — job name or type can data  
dure type will form allow

float marks = (int) (99.97f)

public class TaxCalculator {  
    public static void main

    float marks = 99.99;

    int marks2 = (int) marks;

    System.out.println(marks2);

Scanner sc = new Scanner  
num we convert  
scanner sc = new Scanner  
karte har using type num  
(System.in),  
float a = 25.12; double  
int b = a;

float lossy conversion from double to  
float a = 26.12;

int b = a;

Incompatible types: possible lossy conversion from float to  
int

int b = a;

float a = 25.12f; int  
int b = a;

char ch = 'a';  
char ch2 = 'b';

int number = ch;  
int number2 = ch2;  
System.out.println(number);

char ch = 'a';  
char ch2 = 'b';

int number = ch;  
int number2 = ch2;  
System.out.println(number);

Type casting

System.out.println(b);

Type casting — narrowing conversion

Type promotion in expressions

Java automatically promotes each type short, or

char operand to int when evaluating an expression

2) If one operand is long, float or double the  
whole expression is promoted to long, float, or  
double respectively.

a + b \* c / e  
long

int float char

```

import java.util.*;
public class JavaBasics {
    public static void main (String [] args) {
        char a = 'a';
        char b = 'b';
        System.out.println ((int) (b));
        System.out.println (a);
        System.out.println (b-a);
    }
}

```

3  
"Type promotion can be " done  
only through operations

~~short a = 5;~~  
~~byte b = 25;~~  
~~char c = 'c';~~  
~~byte d = a+b+c; → (byte) cast;~~  
~~int e = possible lossy conversion from int to~~  
~~int f = byte b + a + b + c; → OP = 127~~

byte → short → int → double  
float → long → double

4  
import java.util.\*;  
public class JavaBasics {
 public static void main (String args[]) {
 char a = 'a';
 char b = 'b';
 char c = a-b;
 }
}

5  
Public class JavaBasics {  
public static void main (String args[]) {  
 int a = 10;  
 float b = 20.25f;  
 long c = 0.5;  
 double d = 30;  
 System.out.println (a+b+c+d);  
 System.out.println (a);  
 System.out.println (b);  
 System.out.println (c);  
 System.out.println (d);  
}

~~OP Errors~~  
~~int ans = a+b+c+d;~~  
~~System.out.println (ans);~~

~~error byte b = a+b+c;~~

## Practice set - 2.

Q1 Area of 3 numbers

```
// wrong
byte b = 5;
int b = (byte) (b*2);
b = b * 2;
```

$b = 5$  is  $\text{byte}$  type  
 $b = 2$  is  $\text{int}$  type  
 $b = 10$  is  $\text{int}$  type  
 $b = 128$  is  $\text{int}$  type  
 value it gets converted into  
 expression.

int a = sc.nextInt();
int b = sc.nextInt();
int c = sc.nextInt();

int avg = a+b+c / 3;

Area of square  
 $\text{import java.util.*};$

```
public class Pset2_2 {
    public static void main (String [] args) {
        Scanner sc = new Scanner (System.in);
        int side = sc.nextInt ();
        area = side * side;
        System.out.println (area);
```

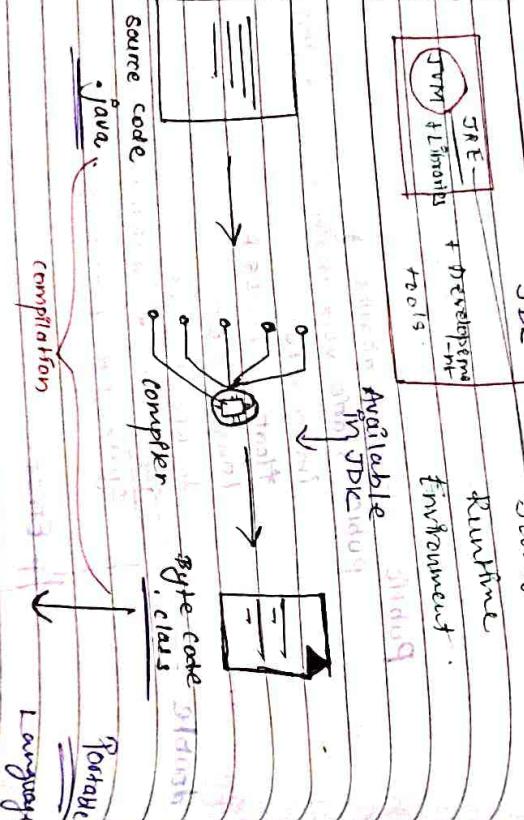
83 cost of 3 items + 18% gst

```
import java.util.*;
public class Pset2_3 {
    public static void main (String [] args) {
        Scanner sc = new Scanner (System.in);
    }
```

```
float pencil = sc.nextFloat ();
float pen = sc.nextFloat ();
float eraser = sc.nextFloat ();
```

```
float cost = pencil + pen + eraser;
System.out.println (cost);
System.out.println (cost + (0.18 * cost));
```

Execution



Windows Native code  
 Mac OS Native code  
 Linux Native code

## Operators

Binary — two operands    Unary — one operand

§ 4.      result?

byte b = 4;  
char c = 'a';

short s = 1000;

int i = 8.1 + f;

float f = 9.9, 9.95;

double d = 9.9, 9.95;

{  
Type promotion.

result = (f \* b) + (s / c) - (d \* s);

modulo — %.  
→ to get remainder     $A \% B = 10 \% 5 = 0$

$5 \% 3 = 2$

§ 5

Print 24  
NO error

because variables can  
be started with

"\_"

Example

```
import java.util.*;
public class JavaBasics {
    public static void main (String args) {
        int A = 10;
        int B = 5;
        System.out.println ("Add;" + (A+B));
    }
}
```

Unary.

$a = a + 1$        $+ +$   
 $a = a - 1$        $- -$

Pre Increment      Post Increment  
 $+ + a$        $a + +$

1) Value will be change  
2) value use

for ex:

int a = 10;

a++

print ln (a);

print ln (b);

b

a ho gaya

b ho gaya

and 'b' mein

a ho gaya 11.

int b = --a;

sysout (a) → 11

sysout (b) → 11

int a = 10;

a = 10

b = a++

1) a ko increase kija.

2) value change

print ln (a);

a ho gaya

10

int a = 10;

a

b = a++;

10

int b = a++;

10

int a = 10;

a

b = a++;

10

int a = 10;

a

b = a++;

10

int a = 10;

a

b = a++;

10

True.

Pre-decrement

- - a

Post

decrement

a --

value change

1) value use — puran

2) value change

int a = 10;

sysout (a);

sysout (b);

a

b

10

9

Relational operators

= =

A = B

(10) (5)

→ false

! =

A = B

(10) (10)

→ true

<

A = B

(10) (10)

→ =

public class JavaBasics

public static void

main (String args []),

int a = 10;

int B = 5;

sysout (A = B);

O/P = False

Page No. / /

\*  $\frac{1}{\top} \Rightarrow$  True

$\wedge =$   
 $\wedge = C_5$

False

$\wedge =$   
 $\wedge = C_{10}$

True

$\wedge > B$   
 $\wedge > C_5$

False

$\wedge > B$   
 $\wedge > C_{10}$

True

$\wedge > B$   
 $\wedge > C_5$

True

$\wedge > B$   
 $\wedge > C_{10}$

False

\* Logical operators.

\* AND —  $\wedge$       Sysout ( $(C_3 > 2) \wedge (C_5 < 0)$ );  
AND —  $\wedge$       O/P — False

\* OR —  $\vee$       Sysout ( $(C_3 > 2) \vee (C_5 < 0)$ );  
OR —  $\vee$       O/P — True

\* NOT —  $\neg$       True  $\rightarrow$  False;  
False  $\rightarrow$  True

$C_3 > 2$   
 $T \rightarrow$  False

$C_5 < 0$   
 $T \rightarrow$  True

### Assignment operators

$\leftarrow$        $A = B$   
 $\leftarrow$        $A = A + 10$       same operand

$\leftarrow$        $A + = 10$   
 $\leftarrow$        $B - = 5$

$\leftarrow$

$\leftarrow$

Fig:  
 $\text{Print } A = 10$

$\text{System.out.println}(A);$   
 $A = 10;$

$\text{Print } B = 5;$   
 $B = 5;$

$\text{Print } - = 5;$   
 $- = 5;$

$\text{Print } A = 10$   
 $A = 10;$

$\text{Print } B = 5$   
 $B = 5;$

$O/P = 1$

$\text{Print } C = 5$   
 $C = 5;$

$O/P = 0$

## statements

```
conditional { a > b  
if (condition) { a < b  
    a >= b  
    a == b
```

```
    }  
else {  
    }  
}  
}
```

```
int age = 22;  
if (age >= 18) {  
    System.out.println("adult: drive,  
vote");  
}  
else {  
    System.out.println("not adult");  
}  
}
```

```
81      Point largest of 2 no.  
A = 1, B = 3  
If A > B  
    print "A"  
else  
    print "B"  
}
```

```
If else if else  
if (cond) { — checks second n
```

```
else if (cond) — again checks next if  
else — the upper one if true  
}
```

```
public class JavaBasics {  
    public static void main(String args[]) {  
        int age = 22;  
        if (age >= 18) {  
            System.out.println("adult: drive,  
            vote");  
        }  
        else {  
            System.out.println("not adult");  
        }  
    }  
}  
public class Test {  
    public static void main(String args[]) {  
        int A = 10;  
        int B = 5;  
        if (A >= B) {  
            System.out ("A is largest of 2");  
        }  
        else {  
            System.out ("B is largest of 2");  
        }  
    }  
}
```

## Ternary Operator

Variable = condition? statement1 : statement2;

If True

Boolean larger = ( $5 > 3$ ) ? 5 : 3;

If False  
stores here

String type = ( $5 \% 2 == 0$ ) ? "even" : "odd";

If this is true  
else here

If cond = 1 gets True

```
import java.util.*;
public class JavaBasics {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int number = nextInt();
        String type = ((number % 2 == 0) ? "even" : "odd");
        System.out.println ("Enter your number" + type);
    }
}
```

```
Even or odd
public class JavaBasics {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        if (n % 2 == 0) {
            System.out ("Entered no. is even");
        } else {
            System.out ("Odd");
        }
    }
}

if
import java.util.*;
public class JavaBasics {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int age = sc.nextInt();
        if (age >= 18) {
            System.out ("Adult");
        } else if (age <= 19 && age >= 13) {
            System.out ("Teenager");
        } else {
            System.out ("Child");
        }
    }
}
```

### Income Tax calculator.

```
income tax calculator.  
income (user)  
int income (calculator)  
int tax (income < 5L) {  
    if (income < 10L) {  
        tax = 0;  
    } else if (income >= 5L) {  
        tax = income * (0.2);  
    } else if (income >= 10L) {  
        tax = income * (0.3);  
    } else {  
        tax = income * (0.3);  
    }  
  
print the largest of  
A=1 B=3 C=6  
if ((A>B) & (A>C)) {  
    print ("A");  
} else if ((B>C)) {  
    print ("B");  
} else {  
    print ("C");  
}
```

### Keyword

#### switch statement

```
switch (variable){  
    case1:  
        variable's value is also 1  
    case2:  
        variable's value is also 1  
    case3:  
        comparing variable with  
        cases & if gets True  
    case4:  
        Default:  
}  
else  
print ("C");  
}
```

import java.util.\*;  
public class TaxCalculator {

public static void main (String [] args){  
 Scanner scanner = new Scanner (System.in);  
 int marks = scanner.nextInt();  
 String reportcard= marks >= 90 ? "Pass":  
 "Fail";  
 System.out.println ("Marks in Percentage: "+  
 reportcard);  
 }  
}

```
public static void main (String [ ] args) {  
    int number = 2;  
    switch (number) {  
        case 1: System.out.println ("Samosa");  
        case 2: System.out.println ("Mango shake");  
        case 3: System.out.println ("We are dreamin'");  
        default : System.out.println ("");  
    }  
}
```

3  
In switch true after the condn  
gets satisfied true if starts  
not condn gets default we need to apply  
executing for that break

```
switch (operator) {  
    case '+' : System.out.println (a+b);  
    break;  
    case '-' : System.out.println (a-b);  
    break;  
    case '*' : System.out.println (a*b);  
    break;  
    case '/' : System.out.println (a/b);  
    break;  
    case '%' : System.out.println (a%b);  
}
```

3  
true condn after  
condn starts

3

3

Question

Java program to get a number from user & print whether it is +ve or negative

```
import java.util.*;  
public class JavaBasics {  
    public static void main (String [ ] args) {  
        Scanner sc = new Scanner (System.in);  
    }  
}
```

```
int a = sc.nextInt ();  
if (a > 0) {  
    System.out.println ("Positive");  
} else {  
    System.out.println ("Negative");  
}
```

3  
int b = sc.nextInt ();  
char operator = sc.next ('+')  
String single input  
char to length.

Q2

```
public class ThirdPset {  
    public static void main (String [] args) {  
        double temp = 103.5;  
        if (temp > 100) {  
            System.out ("You have a fever");  
        } else {  
            System.out ("Your body temp is normal");  
        }  
    }  
}
```

Q3

```
import java.util.*;  
public class ThirdPset {  
    public static void main (String [] args) {  
        Scanner sc = new Scanner (System.in);  
        int week = sc.nextInt();  
        switch  
            System.out ("Enter the week day from 1 to 7");  
        switch (week) {  
            case 1: System.out ("Sunday");  
            break;  
            case 2: System.out ("Monday");  
            break;  
            case 3: System.out ("Tuesday");  
            break;  
            case 4: System.out ("Wednesday");  
            break;  
            case 5: System.out ("Thursday");  
            break;  
            case 6: System.out ("Friday");  
            break;  
            case 7: System.out ("Saturday");  
            break;  
        }  
    }  
}
```