

DSA

Java

- ↳ Printing
- ↳ Conditionals
- ↳ Looping

} If you are just starting out

Printing

System.out.println("Let's gooo...");

Output:
Let's gooo...

Anything provided here in double quotes (" ") will be printed as it is.

System.out.println ("One");
System.out.println ("2+3");
System.out.println ("5 < 6");

Output:
One
2+3
5 < 6

println vs print

`println` → Prints the output and leaves the cursor in the next line. Next output hence will be printed from the next line.

`print` → Will leave the cursor in the same line.



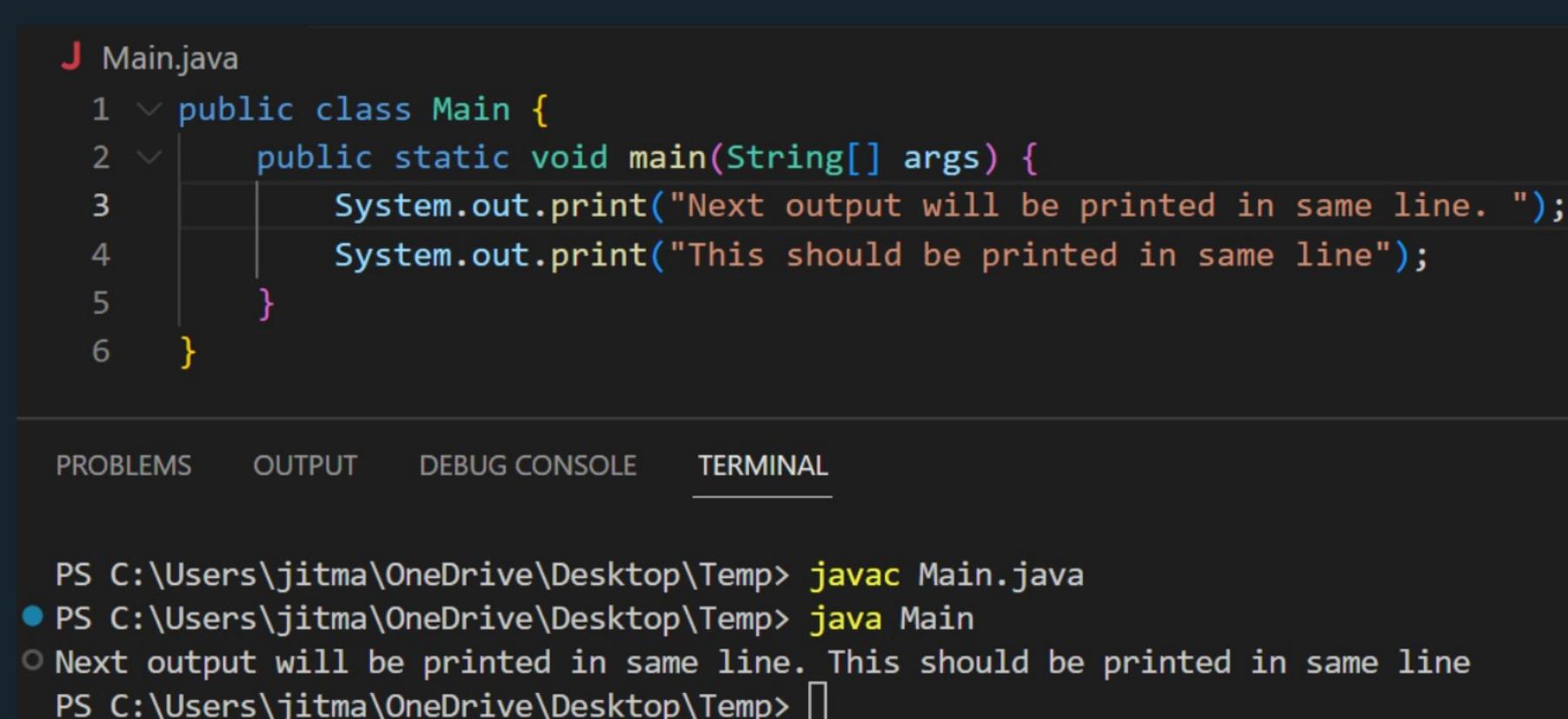
```

J Main.java X

J Main.java
1 public class Main {
2     public static void main(String[] args) {
3         System.out.println("Next output will be printed in newline");
4         System.out.println("This should be printed in newline");
5     }
6 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

- PS C:\Users\jitma\OneDrive\Desktop\Temp> `javac Main.java`
- PS C:\Users\jitma\OneDrive\Desktop\Temp> `java Main`
Next output will be printed in newline
This should be printed in newline
- PS C:\Users\jitma\OneDrive\Desktop\Temp> []



```

J Main.java
1 public class Main {
2     public static void main(String[] args) {
3         System.out.print("Next output will be printed in same line. ");
4         System.out.print("This should be printed in same line");
5     }
6 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

- PS C:\Users\jitma\OneDrive\Desktop\Temp> `javac Main.java`
- PS C:\Users\jitma\OneDrive\Desktop\Temp> `java Main`
Next output will be printed in same line. This should be printed in same line
- PS C:\Users\jitma\OneDrive\Desktop\Temp> []

Operators



Arithmetic Operators

Arithmetic operators are used to perform common mathematical operations.

Operator	Name	Description	Example
+	Addition	Adds together two values	$x + y$
-	Subtraction	Subtracts one value from another	$x - y$
*	Multiplication	Multiplies two values	$x * y$
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	$x \% y$

$$\begin{aligned} 2 + 5 &= 7 \\ 8 - 3 &= 5 \\ 3 * 5 &= 15 \end{aligned} \quad \left. \begin{array}{l} \text{Same as common maths} \\ \text{part) } \end{array} \right\}$$

$5/3$ [integer division will result in loss of decimal part)
 $5/3 = 1$
Modulo operator \rightarrow remainder when a is devideed by b

Usage:

$a \% b \rightarrow$ returns remainder

$$10 \% 3 = 1$$

$$3 \% 3 = 0$$

$$5 \% 3 = 2$$

$$46 \% 100 = 46$$

$$452 \% 10 = 2$$

$$-28 \% 3 = -1$$

Comparison Operator



Operator	Name	Example
<code>==</code>	Equal to	<code>x == y</code>
<code>!=</code>	Not equal	<code>x != y</code>
<code>></code>	Greater than	<code>x > y</code>
<code><</code>	Less than	<code>x < y</code>
<code>>=</code>	Greater than or equal to	<code>x >= y</code>
<code><=</code>	Less than or equal to	<code>x <= y</code>

a operator b → Produces binary output, true or false based on condn.

J Main.java

```
1 public class Main {  
2     public static void main(String[] args) {  
3         System.out.println(3 < 4);  
4         System.out.println(5 <= 5);  
5         System.out.println((3 * 2) == 9);  
6         System.out.println(4 != (2 * 2));  
7         System.out.println(56 >= 12);  
8         System.out.println(45 != (45 % 100));  
9     }  
10 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS C:\Users\jitma\OneDrive\Desktop\Temp> javac Main.java
● PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main
○ true
true
false
false
true
false
PS C:\Users\jitma\OneDrive\Desktop\Temp> □

Variables



Why can't we just hardcode values?

↳ VARIABLES ARE CONTROLLABLE

Data types

byte }
short } 1, 3, 45, -72, 42976
int
long }

char → 'a', '7',
'*', '!', '&'

boolean → true/false

float } 32.7 64.0
double } -9.8

↳ Different size (you don't have to memorize that
as of now)

Range is calculated using size of a particular datatype

$$2^{\text{bits-1}} - 1$$

Note: Concept of range will be covered again in
depth later

Variables

`int a = 5;` } Declaration and assignment
`int b = -4;` } -ment in the same line

`int c;` → Declaration

`c = 72;` → Assignment

`double x = 72.0;`

`x = 73.4;` ← value will be update

Main.java

```

1  public class Main {
2      public static void main(String[] args) {
3          int a = 6;
4          int b;
5          b = 32;
6          System.out.println(a);
7          System.out.println(b);
8      }
9 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

PS C:\Users\jitma\OneDrive\Desktop\Temp> javac Main.java
● PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main
6
32
○ PS C:\Users\jitma\OneDrive\Desktop\Temp> 
```

Inputs

```
Scanner scn = new Scanner(System.in);
```

```
int a = scn.nextInt();
```

```
double d = scn.nextDouble();
```

↳ assignment operator

↳ right hand side will be resolved first

then it'll be saved in the variable on
the left hand side

J Main.java X

J Main.java

```
1 import java.util.*;
2 public class Main {
3     public static void main(String[] args) {
4         Scanner scn = new Scanner(System.in);
5         int a = scn.nextInt();
6         double b = scn.nextDouble();
7         System.out.println(a + b);
8     }
9 }
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PS C:\Users\jitma\OneDrive\Desktop\Temp> javac Main.java

● PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main

Conditionals



Conditionals

G

marks →

45
50
78
34
96
12
27
42
61
05

Score
 $\{ \text{Score} \geq 40 \rightarrow \text{passed}$
 failed otherwise



37

if (condition) {
 do this
} else {
 do something else
}

⇒

if (marks ≥ 40) {

} else {

}

if (condition) {

• // true → this will be exec

} else {

// condition resulted false

}

if (marks < 40) {

 System.out.println("fail");

} else {

 System.out.println("pass");

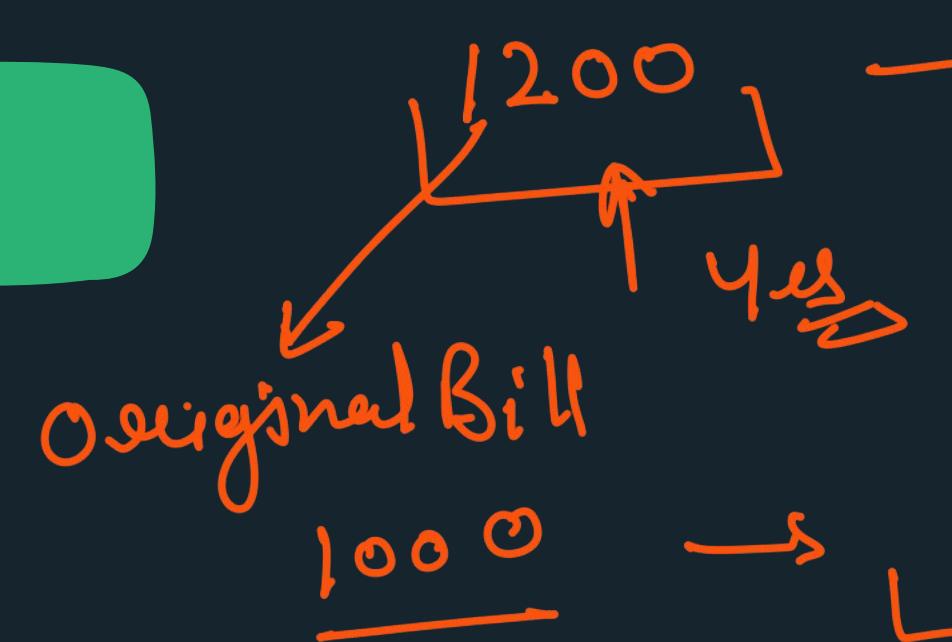
}

J Main.java X

```
1 import java.util.*;
2 public class Main {
3     public static void main(String[] args) {
4         Scanner scn = new Scanner(System.in);
5         int marks = scn.nextInt();
6         if(marks < 40) {
7             System.out.println("Fail");
8         } else {
9             System.out.println("Pass");
10        }
11    }
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main
68
Pass
● PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main
45
Pass
● PS C:\Users\jitma\OneDrive\Desktop\Temp> java Main
12
Fail
○ PS C:\Users\jitma\OneDrive\Desktop\Temp>
```



$x\%$ of y
 10% of 1200

Formula

$$\frac{x}{100} \times xy$$

$$\frac{10}{100} \times \frac{1200}{120}$$

$$\frac{10}{100} \times 1200 = 120 \quad \hookrightarrow \text{Discount Value}$$

$$\text{Final Val} = 1200 - 120 = \underline{\underline{1080}}$$

$$\text{User} \rightarrow \frac{\text{no of units}}{\text{ }} \rightarrow 74$$

$$\boxed{\text{Bill}} = \text{no of units} * 100 \rightarrow 7400$$

\downarrow
before discount

$$\text{Discount} = \frac{10}{100} \times 7400 = \underline{\underline{740}}$$

$$\boxed{\text{Bill}} = 7400 - 740 = \underline{\underline{6660}}$$

After discount

Variable Names

↳ small case character

↳ camel casing ↴

noOfUnitsPurchasedByUser

```
import java.io.*;
import java.util.*;

public class Solution {

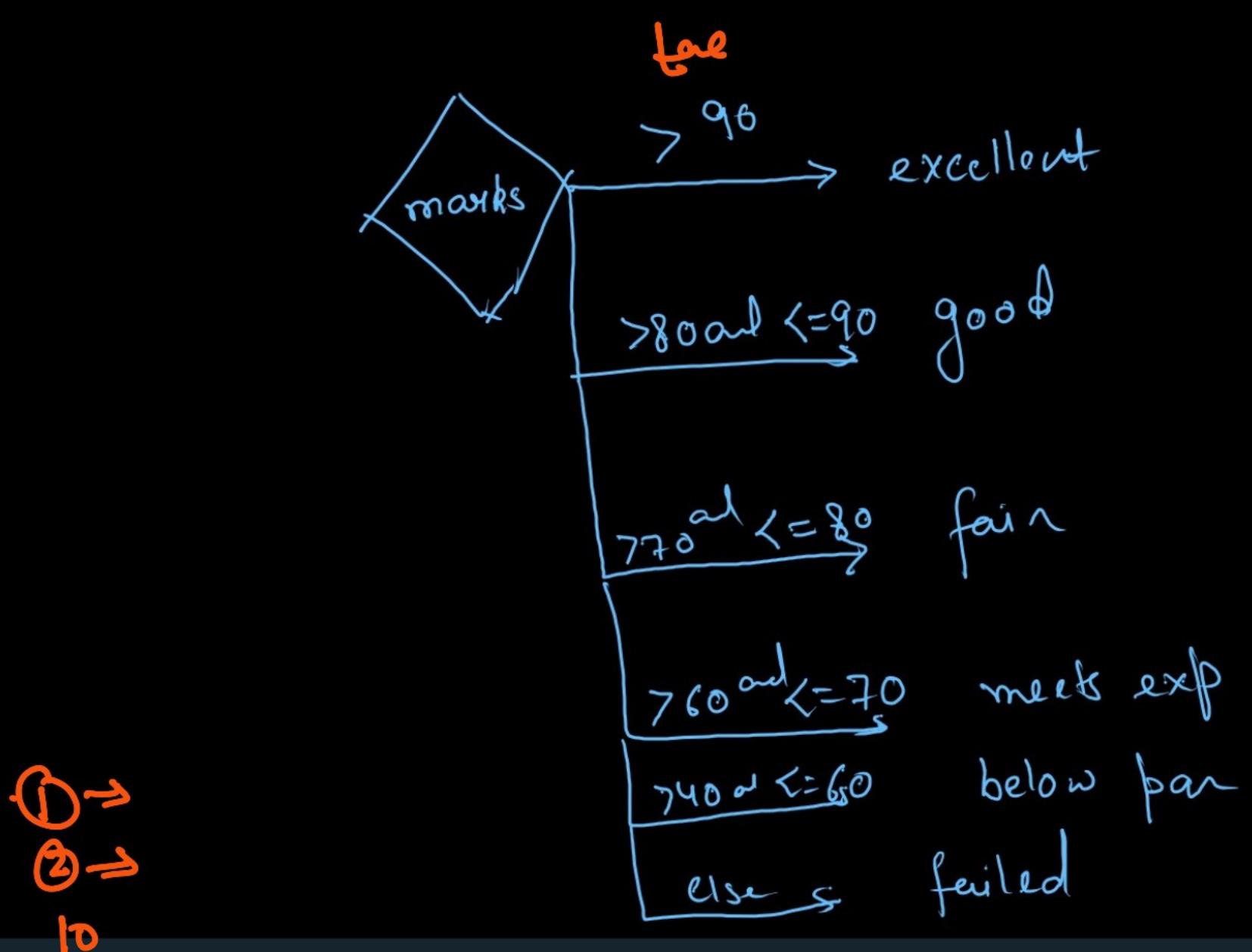
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int noOfUnits = scn.nextInt();
        int billBeforeDiscount = noOfUnits * 100;
        if(billBeforeDiscount > 1000) {
            int discount = (billBeforeDiscount * 10) / 100;
            int finalBill = billBeforeDiscount - discount;
            System.out.println(finalBill);
        } else {
            System.out.println(billBeforeDiscount);
        }
    }
}
```

[-1000, 1000]

8 by 10

int a = 1000
int b = 900
int c = a + b

You are given marks of a student as an integer input. You need to print according to the following rules: 1 for marks above 90, print excellent. 2 for marks above 80 and less than equal to 90, print good. 3 for marks above 70 and less than equal to 80, print fair. 4 for marks above 60 and less than equal to 70, print meets expectations. 5 for marks above 40 and less than equal to 60, print below par. 6 print failed if none of the above conditions follow.



```
→ if (condition 1) {  
    → if (condition 2) {  
        → if (condition 3) {}  
        → } else if (condition 2) {}  
    } else if (condition 1) {}  
} else if (condition 1)
```

if else

A hand-drawn diagram in orange ink on a black background. At the top left, there is a large curly brace symbol. To its right, a vertical dashed line with three horizontal tick marks extends downwards. Below this, the word "else" is written in a cursive font, followed by another curly brace symbol. To the left of the word "else", a horizontal arrow points from left to right, above three parallel, slightly curved lines that extend from the bottom of the "else" brace towards the right edge of the page.

```
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int marks = scn.nextInt();
        if(marks > 90) { //96
            System.out.println("excellent");
        } else if(marks > 80){
            System.out.println("good");
        } else if(marks > 70) {
            System.out.println("fair");
        } else if(marks > 60) {
            System.out.println("meets expectations");
        } else if(marks > 40){
            System.out.println("below par");
        } else {
            System.out.println("failed");
        }
    }
}
```

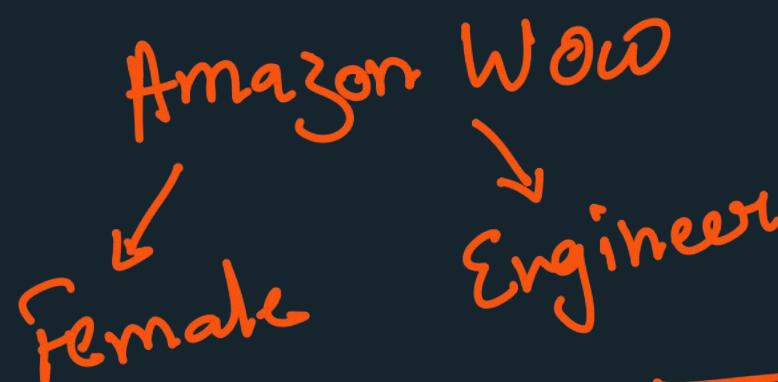
Logical Operators

And

{ → && → And operator

1

1



The diagram illustrates a logical expression using two conditions:

- Cond 1**: $\text{gender} == \text{female}$
- Cond 2**: $q1f > \text{engineer}$

The conditions are connected by the **&&** operator.

$\&\&$ → true \rightarrow ✓ ✓
false \rightarrow otherwise

$\Rightarrow \Leftarrow$
 \Downarrow $a \And b$ \Downarrow $\begin{cases} \text{true} & \text{if } a \And b \text{ are true} \\ \text{false} & \text{otherwise} \end{cases}$

$\wedge\wedge$	{	false false true true	true →	false false false true
----------------	---	--------------------------------	--------	---------------------------------

J Main.java

```
1 import java.util.*;
2 public class Main{
3     public static void main(String[] args) {
4         System.out.println((5 < 7) && (6 > 3)); t && t → t
5         System.out.println(true && (7 <= (3 / 4))); t && f → f
6         System.out.println(false && false); f
7         System.out.println((0 == (3 / 4)) && (0 == (3 / 4.0)))); t && f
8         System.out.println("true && true"); true && true
9     }
10 }
```

$$\frac{3}{4} \rightarrow 0$$

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Σ powershell + √ ⊞ ✎ ... ^ >

- PS C:\Users\jitma\OneDrive\Desktop\FS-14> javac Main.java
 - PS C:\Users\jitma\OneDrive\Desktop\FS-14> java Main
true
false
false
false
true && true
 - PS C:\Users\jitma\OneDrive\Desktop\FS-14> □

OR → ||

≤
Cond 1

≤
Cond 2

↳ Backed

↳ fronted

get the
job

false || false = false

t || f

t

false || true = true

f || t

t

true || false = true

t || t

t

true || true = true

f || f

f

J Main.java

```

1 import java.util.*;
2 public class Main{ ()
3     public static void main(String[] args) {
4         System.out.println((5 < 7) || (6 > 3)); // t || t => t
5         System.out.println(true || (7 <= (3 / 4))); // t
6         System.out.println(false || false); // f
7         System.out.println((0 == (3 / 4) || (0 == (3 / 4.0)))); //t
8         System.out.println("true || true"); // true || true
9     }
10 }
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

▷ pc

● PS C:\Users\jitma\OneDrive\Desktop\FS-14> java Main

● true

true

false

true

true || true

○ PS C:\Users\jitma\OneDrive\Desktop\FS-14> □

NOT (!)

& & || !
and or not



! (Condⁿ)

Condⁿ

true → false
false → true

J Main.java

```
1 import java.util.*;
2 public class Main{
3     public static void main(String[] args) {
4         System.out.println(!(5 < 7)); //f
5         System.out.println(!(7 <= (3 / 4))); //t
6         System.out.println(!false); //t
7         System.out.println((!(0 == (3 / 4.0)))); //t
8         System.out.println("!false"); // !false
9     }
10 }
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

```
PS C:\Users\jitma\OneDrive\Desktop\FS-14> javac Main.java
```

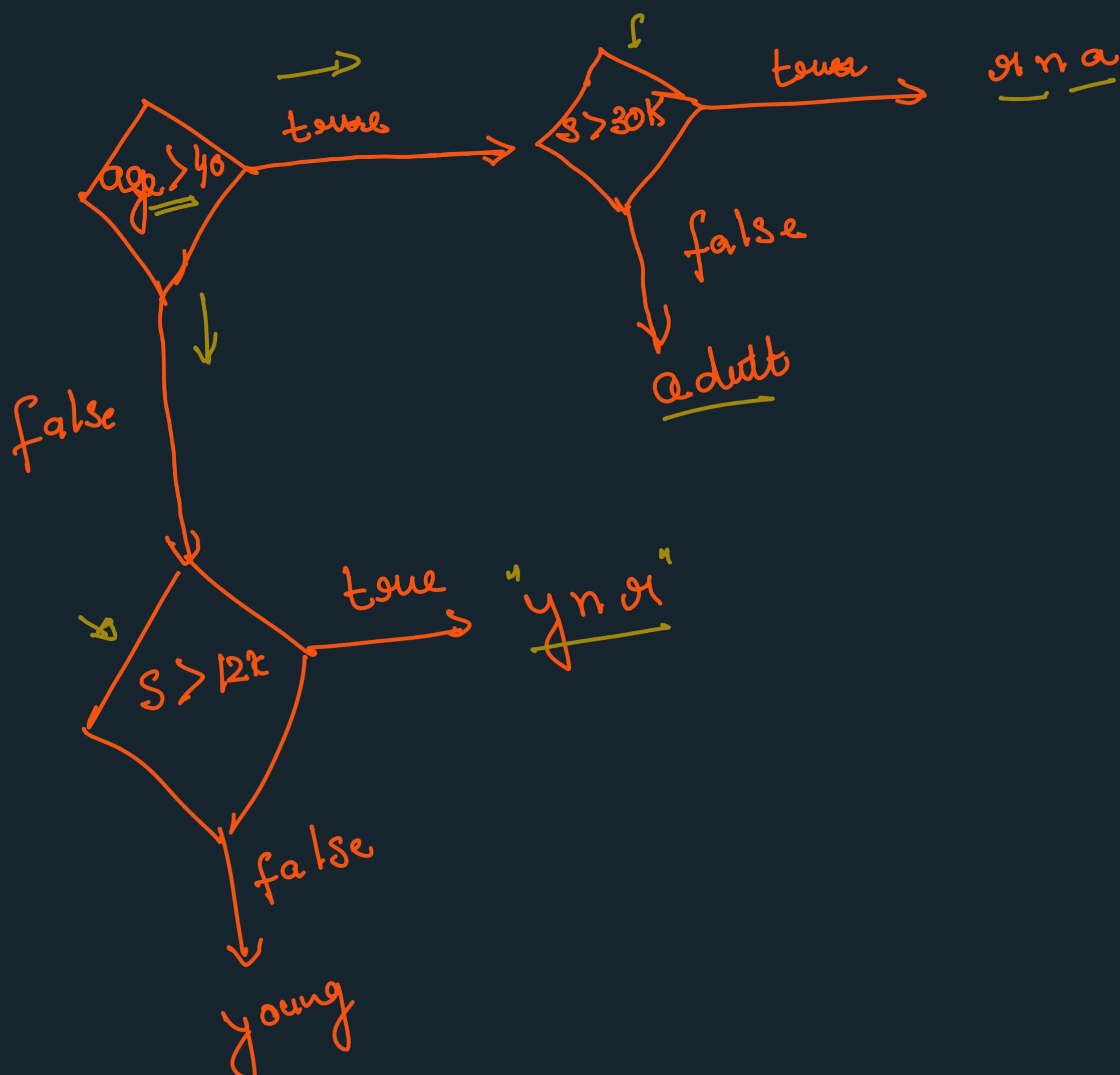
● PS C:\Users\jitma\OneDrive\Desktop\FS-14> java Main

false

true

true

$\rightarrow \frac{35}{34} = 15K$
 $\rightarrow \frac{12}{0} = 15K$



Java 8

```

1 import java.io.*;
2 import java.util.*;
3
4 public class Solution {
5
6     public static void main(String[] args) {
7         Scanner scn = new Scanner(System.in);
8         int age = scn.nextInt(), salary = scn.nextInt();
9         if(age > 40) {
10             if(salary >= 30000) {
11                 System.out.println("You are rich and adult");
12             } else {
13                 System.out.println("You are an adult");
14             }
15         } else {
16             if(salary >= 12000) {
17                 System.out.println("You are rich and young");
18             } else {
19                 System.out.println("You are young");
20             }
21         }
22     }
23 }
  
```

Handwritten annotations on the code and flowchart:

- ① Circled "You are rich and adult" in the code.
- ② Circled "You are an adult" in the code.
- ③ Circled "You are rich and young" in the code.
- ④ Circled "You are young" in the code.
- ⑤ Circled "You are rich" in the flowchart.
- ⑥ Circled "You are adult" in the flowchart.
- ⑦ Circled "You are rich and young" in the flowchart.
- ⑧ Circled "You are young" in the flowchart.

Line: 22 Col: 9

Upload Code as File Test against custom input Run Code Submit Code

$\rightarrow x \neq 3$



112

57

$x \leftarrow \begin{cases} 36 & y > 100 \\ 45 & 50 \leq y < 100 \\ 12 & \text{else} \end{cases}$

