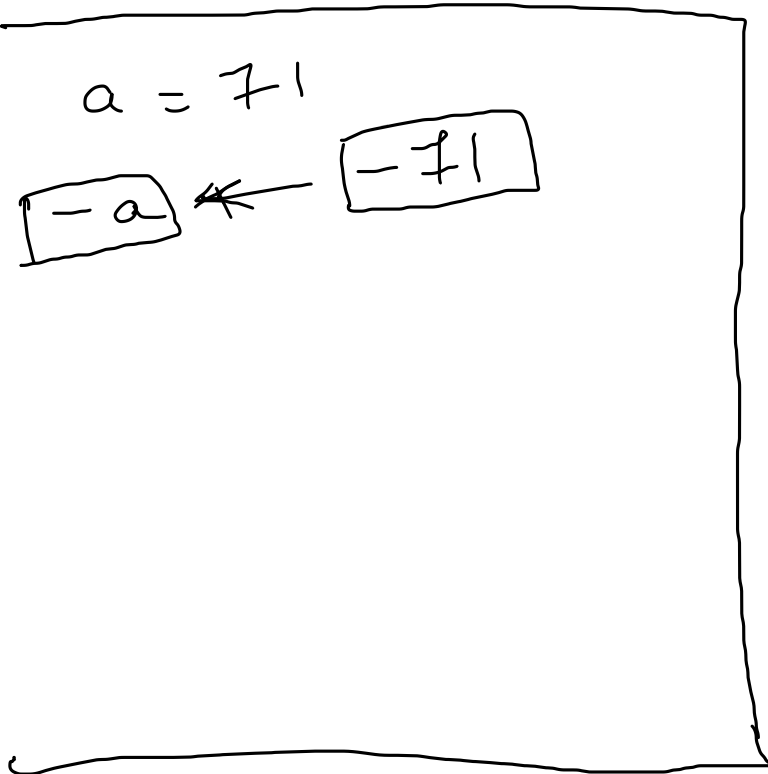


- ① Arithmetic
- ② Relational
- ③ Logical
- ④ Increment/Decrement



Increments



Unary operators



++



Post increment

pre increment

Syn

operand ++

Syn

++ operand

$a = 5$

$b = 3$

$a++ \Rightarrow a = a + 1$

$++b \Rightarrow b = b + 1$

| a will be inc by 1

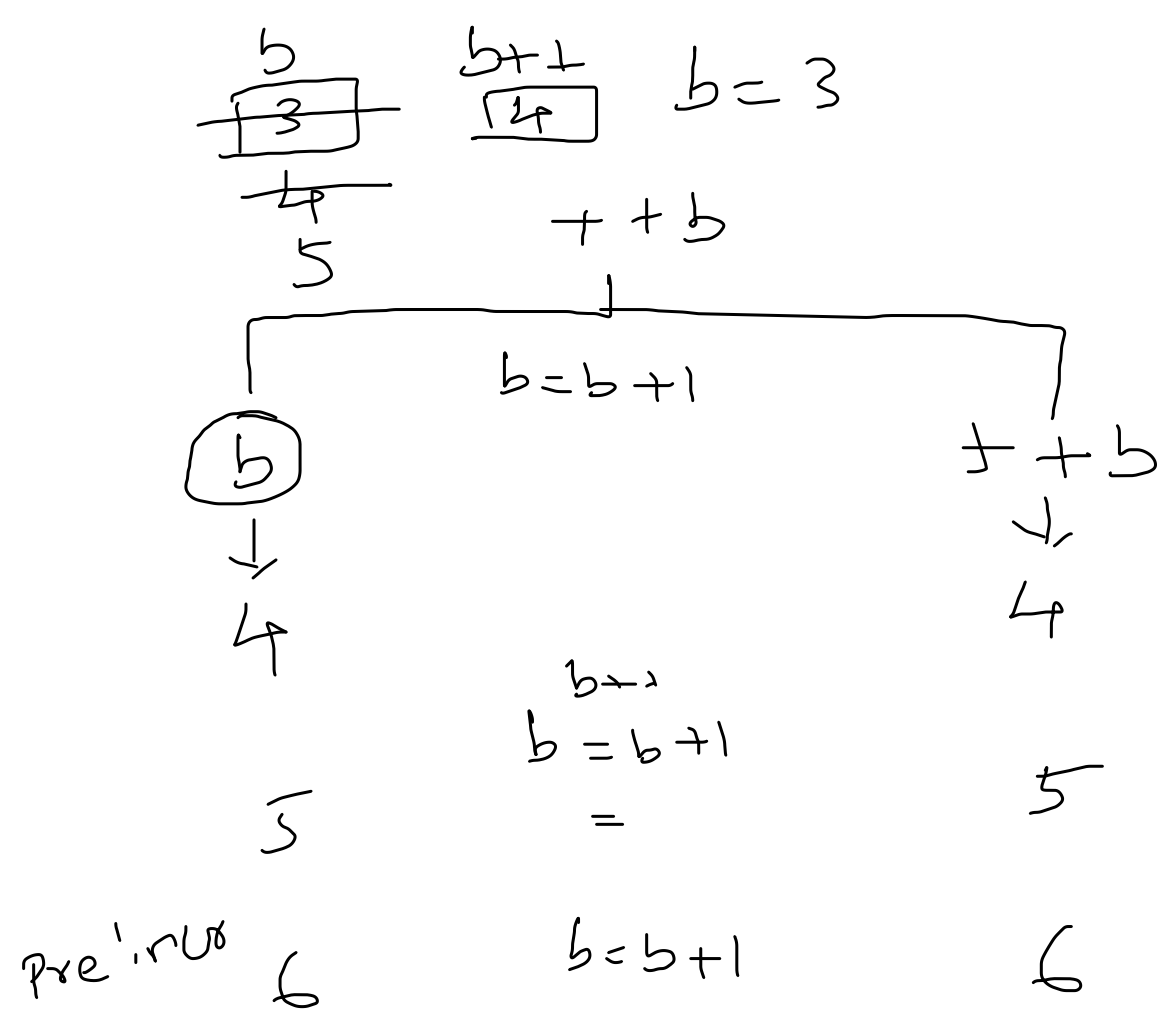
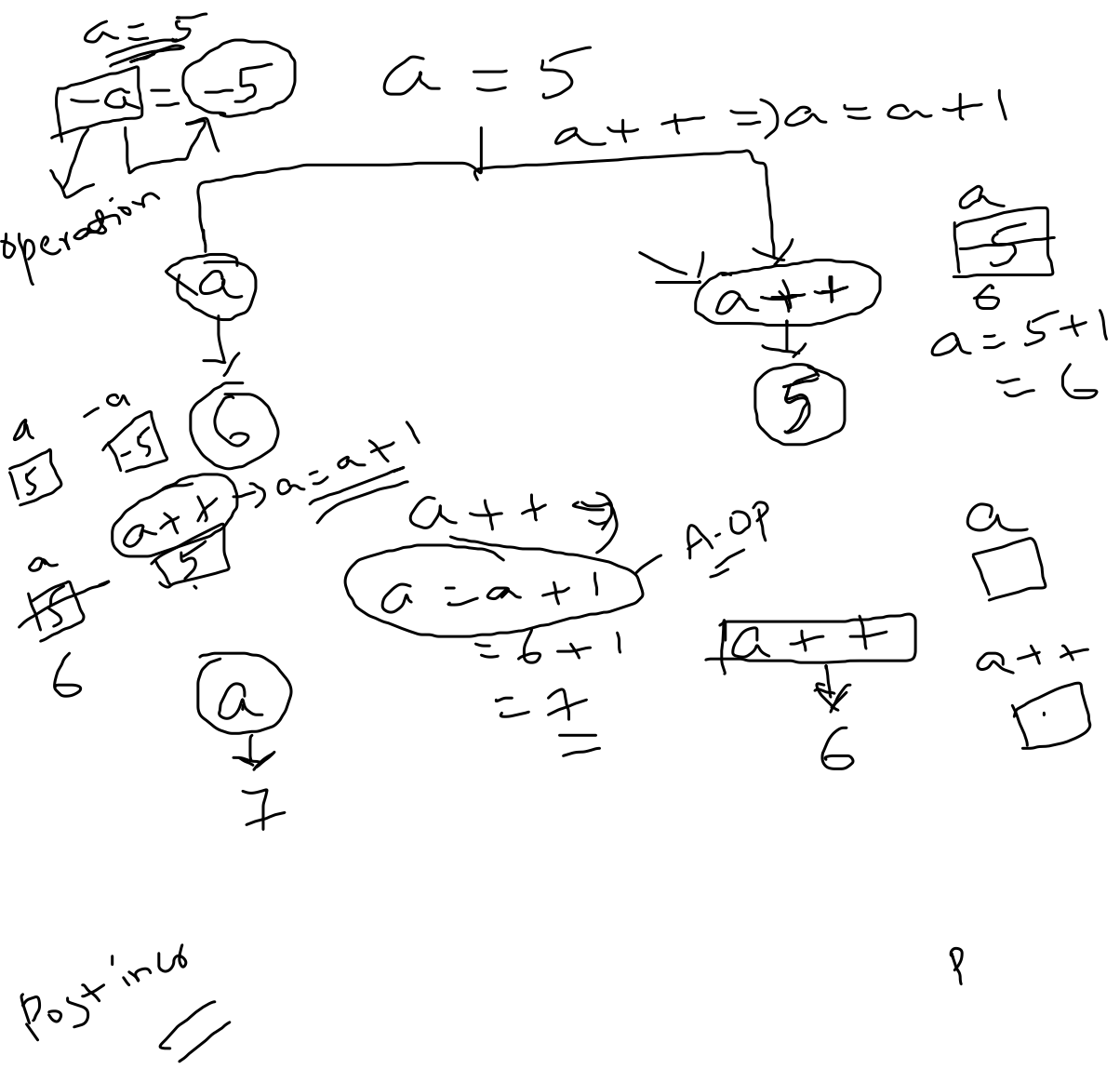
| b incremented by 1

a

a++

b

b++



$a = 5$
 $a++ \Rightarrow a = a + 1$
 $= 5 + 1$
 $a = 6$
[unary]

a
~~5~~
~~6~~
~~7~~
~~8~~

$a++$
~~5~~
~~6~~
~~7~~
 $a++ \Rightarrow a = a + 1$
 $= 6 + 1$
 $a = 7$

$a++ \Rightarrow a = a + 1$
 $= 7 + 1$
 $a = 8$

Decrements (decrease by 1)

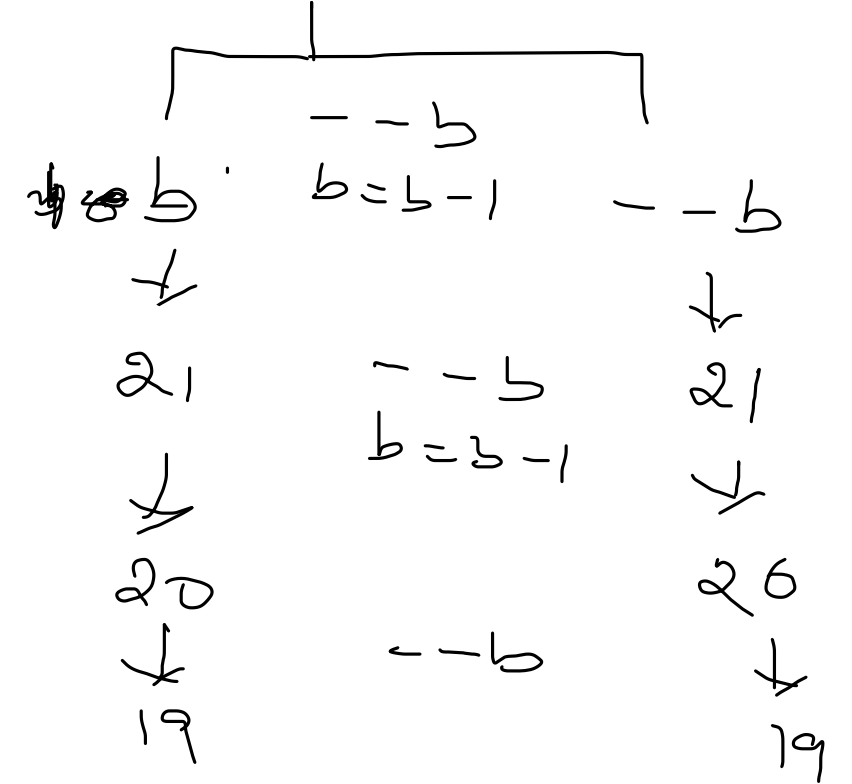
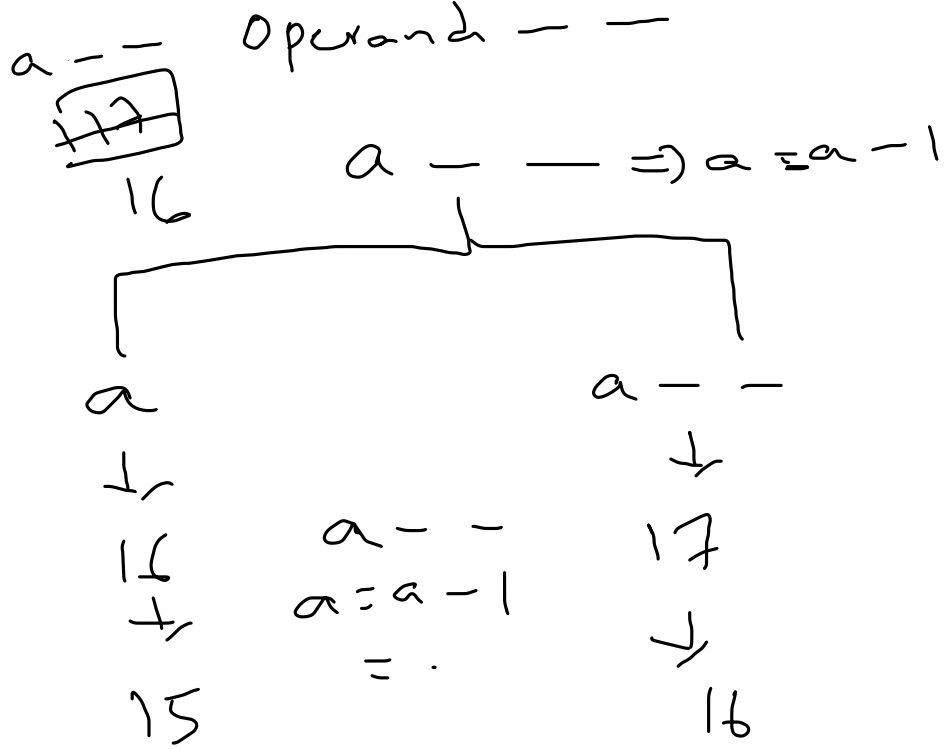
$a = 17$
 $b = 22$

Post Decs

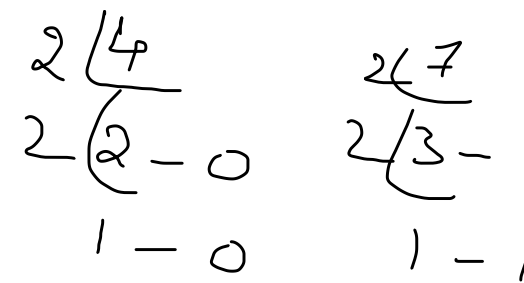
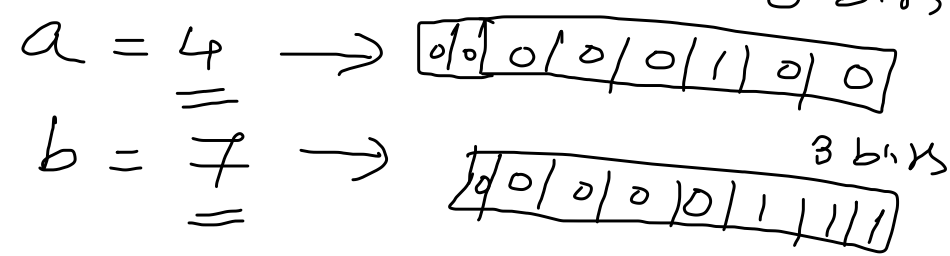
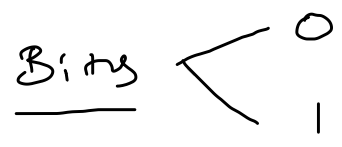
Pre Decs

incr: +
 decr: -

a
~~17~~
 16
 15



Bitwise operators →



X	Y	and $X \& Y$	or $X Y$	xor $X \wedge Y$	complement $\sim X$	$\sim Y$
0	0	0	0	0	1	1
0	1	0	1	1	1	0
1	0	0	1	1	0	1
1	1	1	1	0	0	0

$X < Y \checkmark$
 $X > Y \checkmark$

a
17

a = 17

a++

a = a + 1

a--

a = a - 1

a
↓
18
↓
19

a++
↓
17
↓
18

a++

a
↓
16
↓
15
↓
14

a--

a--

a--
↓
17
↓
16
↓
15



$a=4$
 $b=7$

$a \& b \Rightarrow a | 00000100$

$2 | 4$
 $2 | 2 - 0$
 $1 - 0$

$2 | 7$
 $2 | 3 - 1$
 $1 - 1$

8 bits = $-128 + 127$

$\sim 7 \Rightarrow (-8)$

$\sim 49 \Rightarrow (-50)$

$a \wedge b$
 00000011
 $2^1 \ 2^0$

$a \& b$
 00000100
 $2^7 \ 2^6 \ 2^5 \ 2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0 - 1$

$0+0+0+0+0+4+0+0 \rightarrow 4$

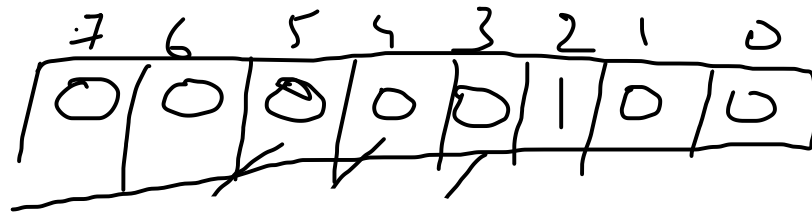
$\sim 4 = (4+1) - 5$
 $2+1 \rightarrow 3$

$\sim a \Rightarrow 11111011$
 $\sim a = a + 1$
 $00000100 + 1$
 00000101
 $2^2 \ 2^1 \ 2^0$
 $5+1$

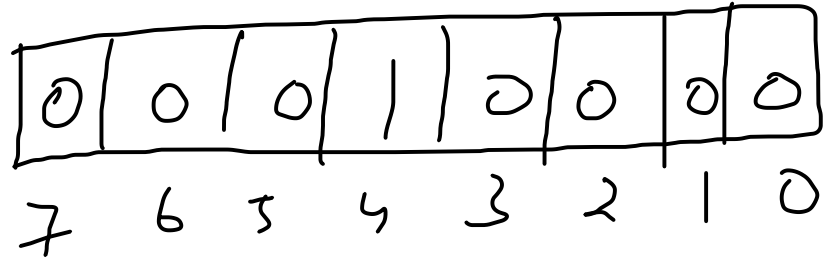
$a \ \& \ b$
 00000111
 $2^2 \ 2^1 \ 2^0$
 $4+2+1 \rightarrow 7$

$$\underline{\underline{a \ll 2}}$$

\Rightarrow

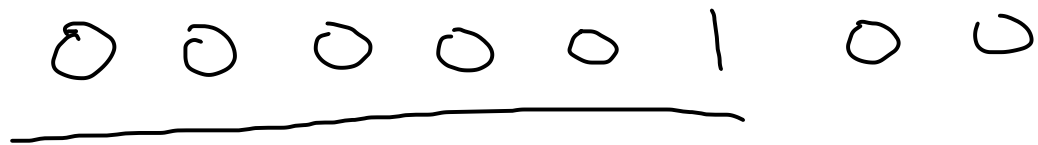


$$a = 4$$



$$a \gg 2$$

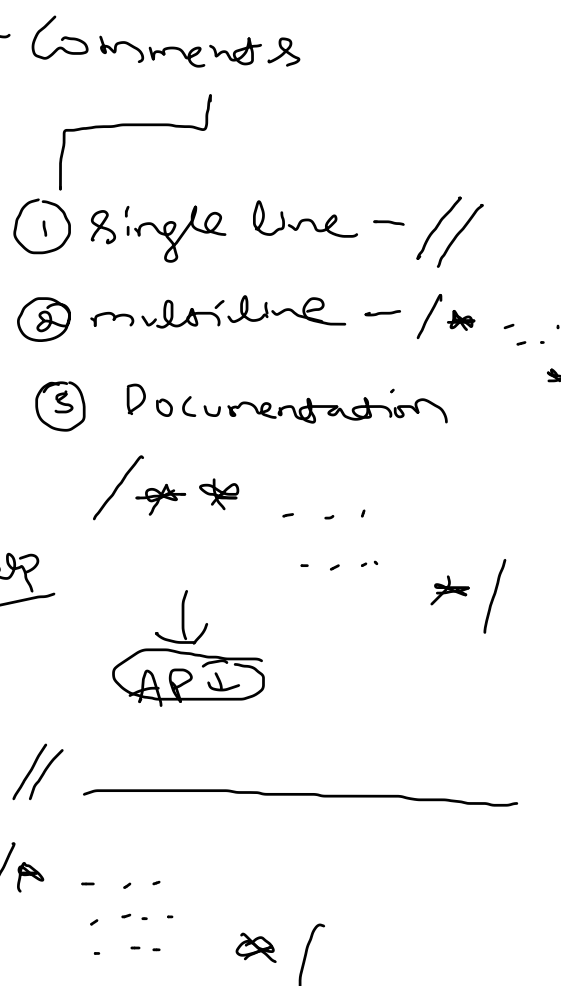
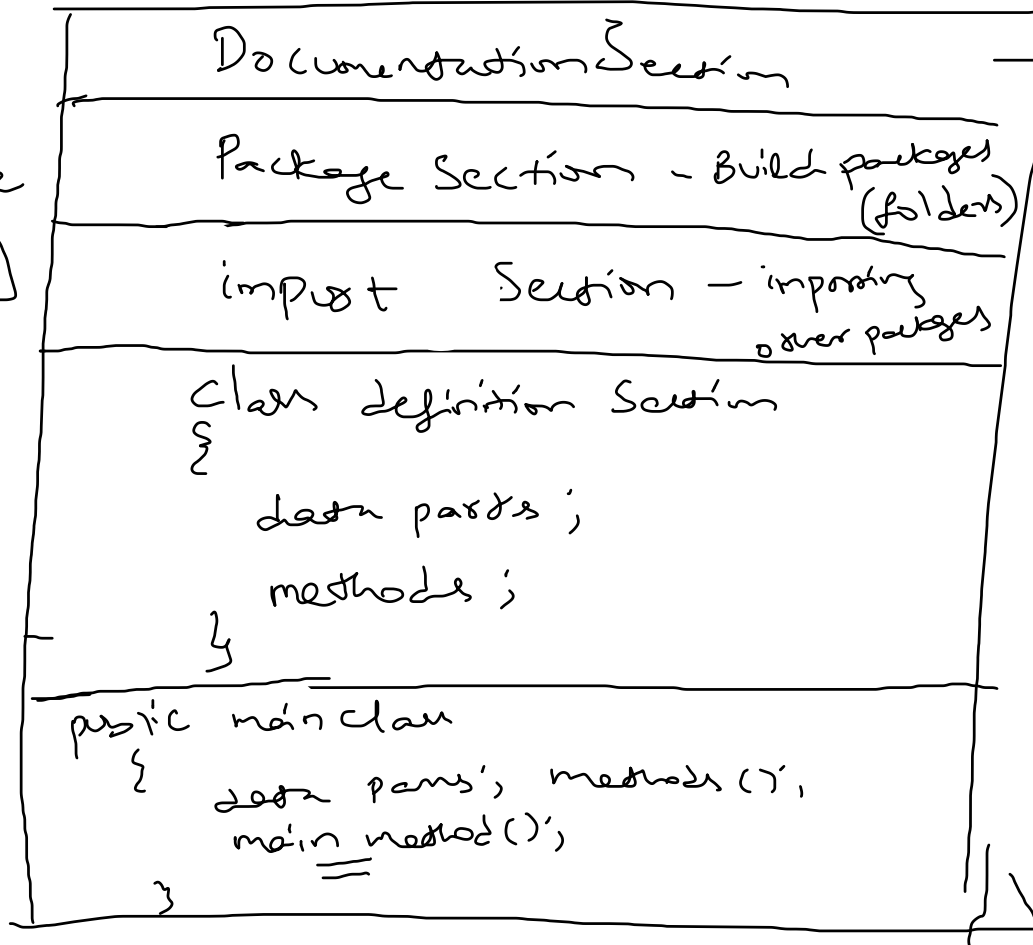
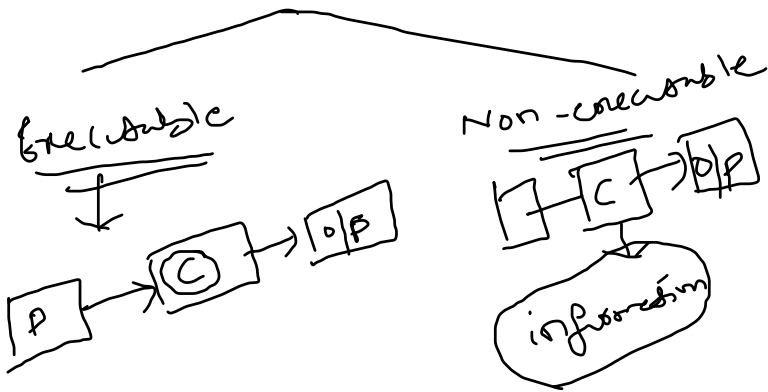
\Rightarrow



Structure of a Java program

// To be run

Program



// ...
 /* ... */

Program execution starts from main method -

Section - A

Section - B

// My First Program

```
class MyFirstClass
```

```
{
```

```
    int x = 501;
```

```
    int y = 607;
```

```
    void add()
```

```
    {
```

```
        System.out.println(x + y);
```

```
    }
```

```
}
```

```
}
```

Rules

①

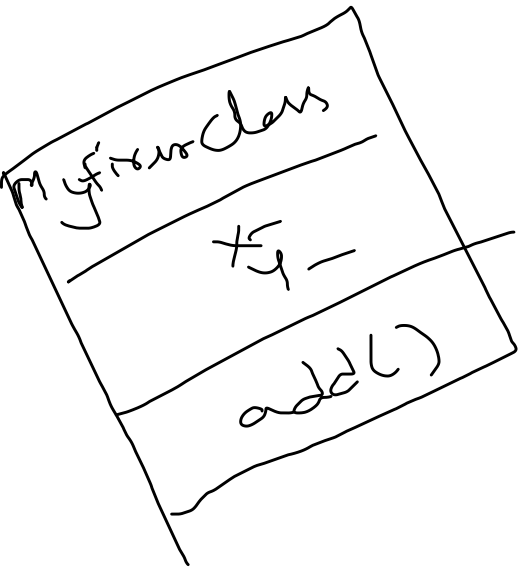
②

⋮

Convention or Suggestion

MyFirstClass

Mean ⇒



```
public class MyFixerMainClass  
{
```

```
    public static void main (String args [])
```

```
    {
```

```
        MyFixerClass mfc = new MyFixerClass ();
```

```
        mfc.add ();
```

```
        System.out.println (mfc.x - mfc.y);
```

```
    }
```

```
}
```