① find largest of 3.

if two are equal
any of them
Can be
largest

A   B   C
3   5   9

A   B   C

A > B
true   false.

A > C   B > C   true   B is largest

true   false   false

A is   C is   C is
largest.   largest!   largest

```
                          ┌─────────┐
                          │  Start  │
                          └─────────┘
                               │
                               ↓
                    ┌────────────────────┐
                    │   read  A, B, C    │
                    └────────────────────┘
                               │
                               ↓
              if          ◇ A>B ◇
                        /          \
                  true /            \ false
                      ↓              ↓
                 ◇ A > C ◇       ◇ B > C ◇  ──true──→  ┌───────────┐
              true /     \ false           \           │ output B  │
                  ↓       ↓                  \ false    └───────────┘
          ┌──────────┐  ┌────────────┐        ↓
          │ output A │  │  output C  │
          └──────────┘  └────────────┘
                   \        │
                    ↓       ↓
                     ( end )
```
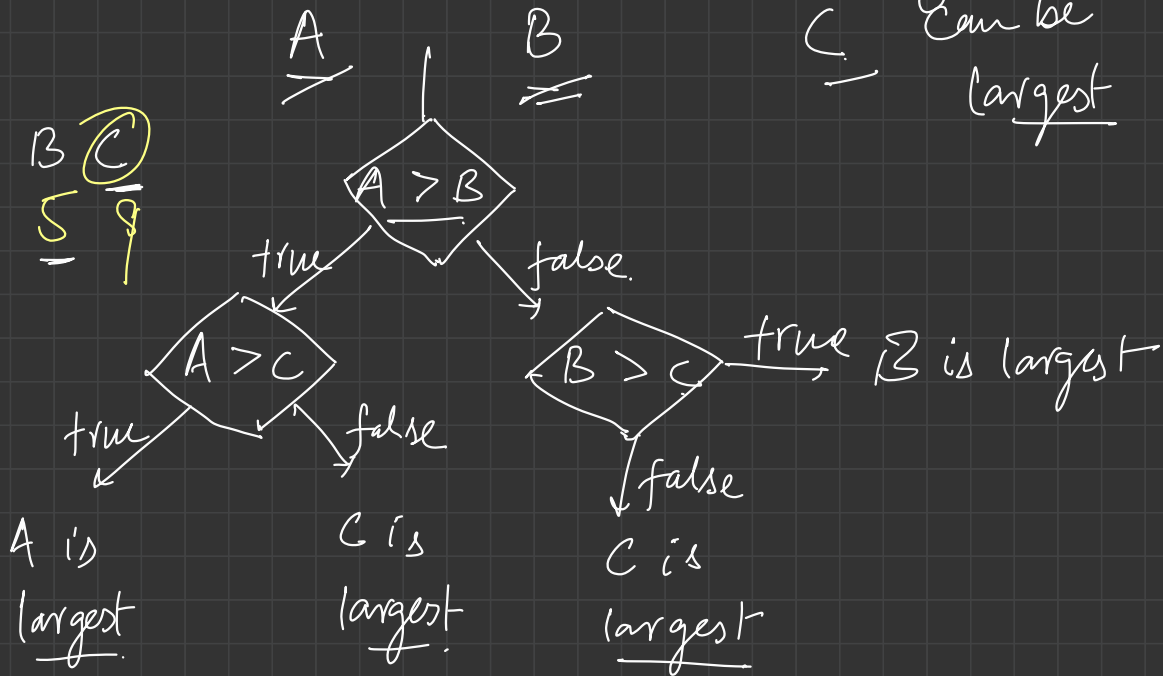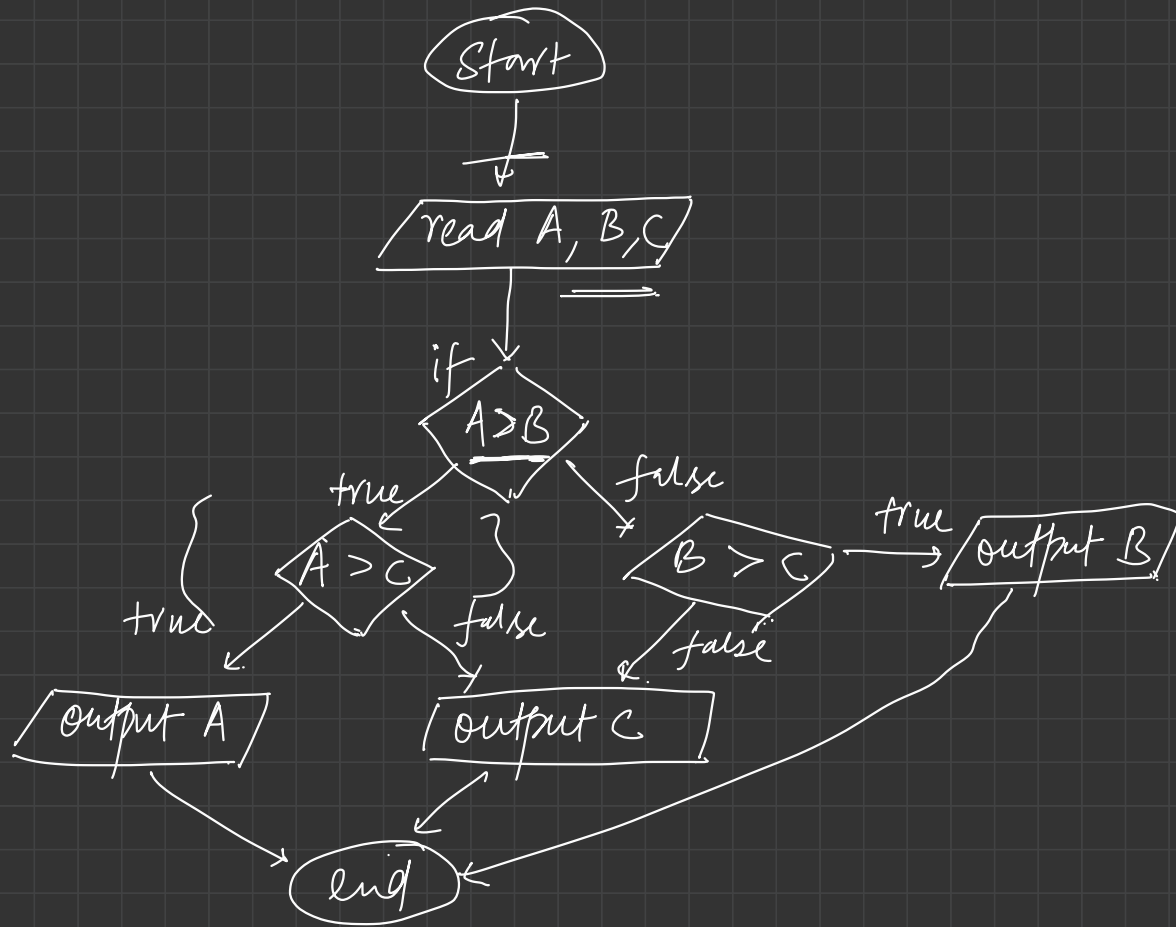
① start

② read A, B, C

③ if $\boxed{A > B}$:

④ if $A > C$,

⑤ output → A

⑥ else $(A \leq C)$

⑦ output → C

⑧ else $(A \leq B)$

⑨ if $B > C$
   3   2

⑩ output → B

⑪ else $(B \leq C)$

⑫ output → C

© ≥ $A > B$

$A \leq C$

$A \to 3$

$B \to 3$

$C \to 2$

true

false

$A \leq B$
$C < B$ $\Rightarrow$ B

$A \leq B \leq C \to C$

(13) end

Q. Print all numbers from 1 to 20.

repitition
⟹ loop
conditian
some work
→ output
[num]

Start

number
<= 20

let i = 1

while
i <= 20

false → end

true

output i

i = i+1

iterate
1, 2, 3, 4, 5, 6, ...20

21

input
output

start/
end

process/
operati

conditionals
loops
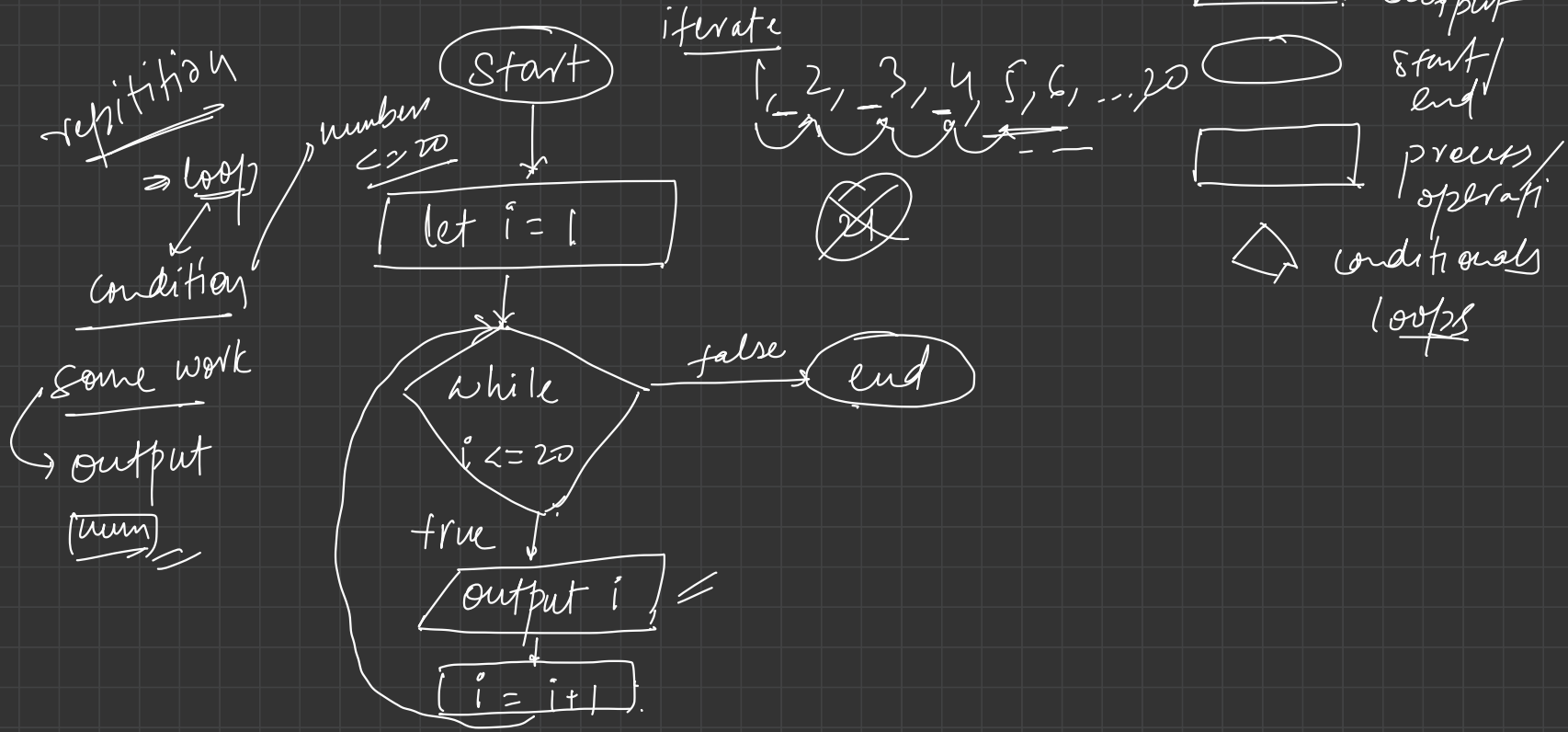
Print all odds from 1 to 20

repetition

$\leq = 20$

1, 3, 5, 7, --, 19

    2   2   2

loop

repeating

```
Start
   ↓
let i = 1
   ↓
While          false
i <= 20    →  end
   ↓ true
output i
   ↓
i = i + 2
```
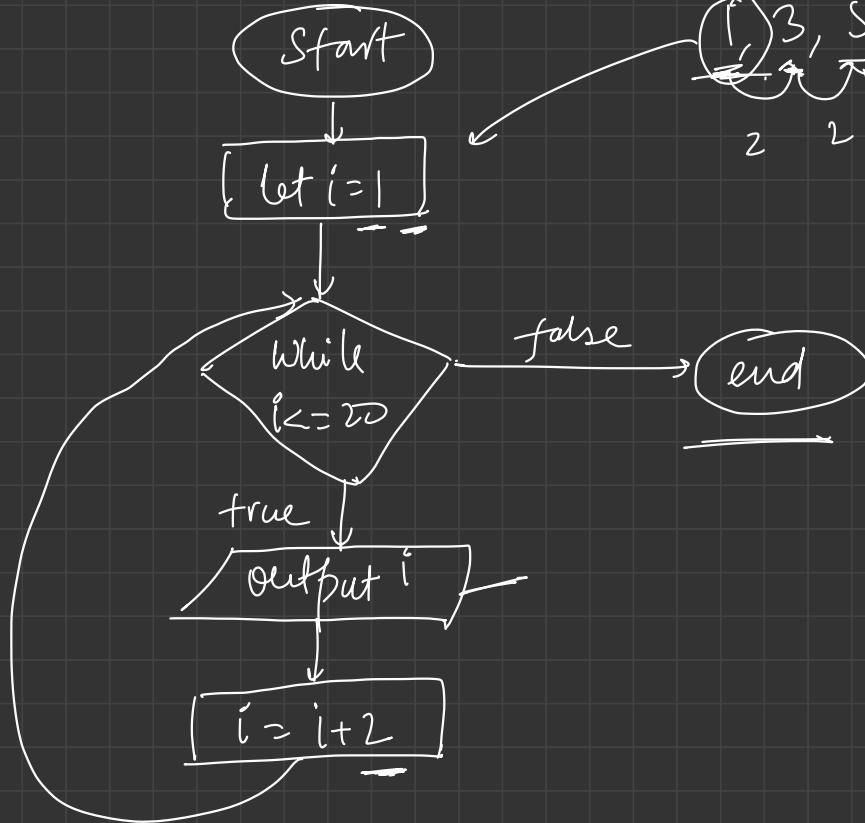
① start

② let $i = 1$ / $i \leftarrow 1$

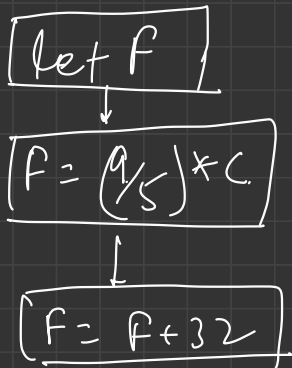③ while $(i <= 20)$ { false

④   Output i

⑤ $i = i + 1$ / $i \leftarrow i + 1$ }

⑥ end

Q.

$$F = \left(\frac{9}{5} \times C \right) + 32$$

```
        ( start )
            |
            v
      / read C /
            |
            v
  | let F = ((9/5) * C) + 32 |
            |
            v
      / output f /
            |
            v
        ( end )
```

| let f |

| F = (9/5) * C |

| F = f + 32 |
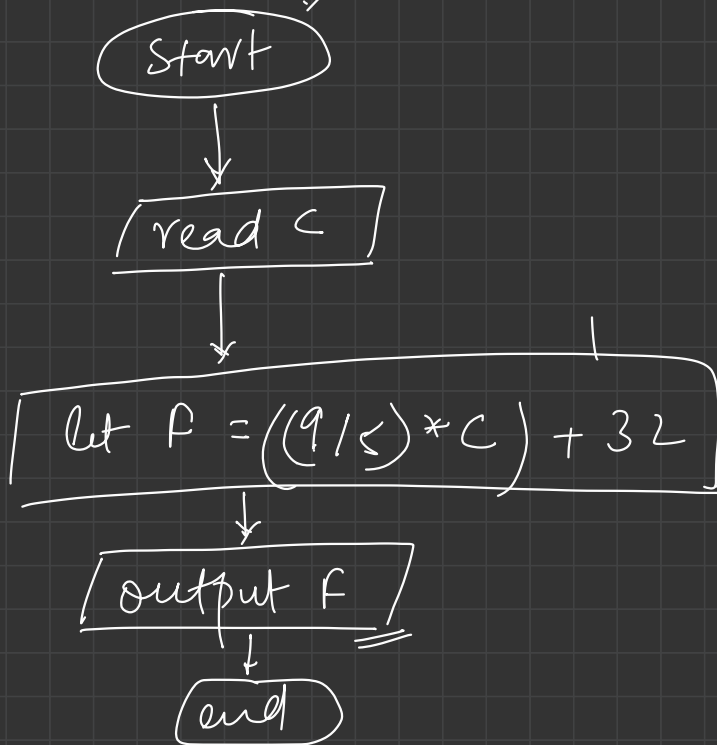
Pseudocode:

1. Start

2. read C

3. $f \leftarrow \left(\frac{9}{5} \times c\right) + 32$

4. output → f

5. end

Q. Read 'a' and 'd', print 10 numbers of the

form, a+d, a+2d, a+3d, a+4d, ---, a+9d, a+10d

a+1d, a+2d

100)   i=1,   1, 2, 3, ---   a + (i)×d   i=1, 2, 3, ---, 10

1 3 5 7,   a+d
                  a+2d
                  a+3d   ⇓

i=1,   1, 2, 3, 4, | a + (i×d)
                               | ⋮
i<=10 | ⋮
                               | a+10d

i=1

→   a+ id = a+d

i=2

i=3   = a+2d

⋮   = a+3d

i=10   = a+10d

```
        ( start )

           |
           v
    / read a, d /        =.

           |
           v
      ( let i = 1 )        =

           |
           v
        < while           false
          i <= 10 >  ----------->  ( end )
                                      ==
      true |
           v
   ( let n = (a + (i × d)) )

           |
           v
     ( output(n) )

           |
           v
      ( i = i + 1 )
```

$a +_q d = a + 1.d$

$i = 1$
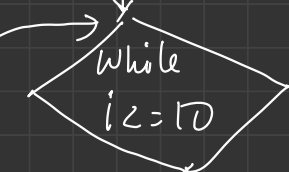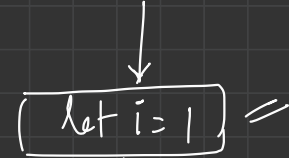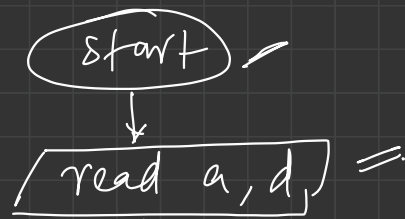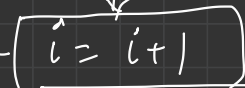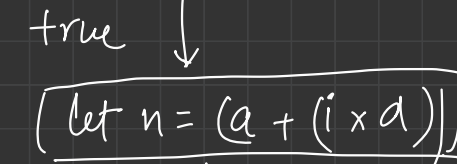
$n = a + id$

Pseudo Code:

① start

② read a, d

③ i ← 1

④ while i <= 10,

⑤ { n ← a + (i × d) }

⑥ output → n

⑦ i ← i + 1

false

⑧ end

Data ⟶ store in variable

Instructions

➤ 6 types

Binary → 0 or 1

Data types : int : 1, 2, 3, 4, -- --, 0, -1, -2, -

float   5.4, 0.21, 1.5, -- --

↳ negatives

booleans : true / false

chars : a, s, c, q, -- , A, B, C, D, ---

%, ?, / · ; · -- , ⬭

{ Strings :   words : combination of characters

sequence of character

integer values

positives (inc 0)

(0, 1, 2, 3, 4, ---- decimal system (0-9)

0, 1 ⟶ binary (0-1)

⑩ ⟶ base

$\underline{5\ 1\ 2\ 4}\ \underline{6}\ \underline{8}\ \underline{7}$ ⟹ 500 0000

10^2

$\cdots 10^3 \quad 10^1\ 10^0$

+   100000

+   20000

+   4000

+   600

10

5×10^6

+ 1×10^5

+ 2×10^4

+ 4×10^3

+ 6×10^2

$+$

$+$

$8\ 0$ $\quad +\ 8 \times 10^1$

7 $\qquad +\ 7 \times 10^0$

$1, 2, 3, 4, \ - \ -$

base $\to 2$

$-\quad 5\ 4\ 3\ 1\ 2\ 6$

$(0, 1) \quad \to 0 \to 0$

$\qquad\qquad 10^5\ 10^4\ 10^3 --$

$1 \to 1$

$2 \to 10$

$3 \to 11$

$4 \to 100$ 1101 $(0, 1)$

$5 \to 101$

$6 \to 110$ $2^0 \times 1 \to 1$

$7 \to 111$ $2^1 \times 0 \to 0$

$8 \to 1000$ $2^2 \times 1 \to 4$

$2^3 \times 1 \to 8$

$\{ 1101 \}$

13

13

Binary (0,1)

$$0 \quad 1$$

4 → 100

5 → 101

Integers   0, 1, 2, 3, 4, 5, 6, —, —

Binary representation,   0s and 1s

{ 13 → 1101
  27 → 11011
  3 → 11 }

mathematical X

conversion X

-ve integers) $\rightarrow$ (positive) $\rightarrow$ Binary rep.

$$\Downarrow$$

~~digits~~ digits flip

$0 \rightarrow 1$

$1 \rightarrow 0$

(add 1)

35.612

$$\Downarrow$$

35612×10^{-3}

$$\Downarrow$$

(35612) (-3) integers

a, b, c, . . . —

ASCII

46.012

Binary

numbers (int)

0 - 127

(46012) × 10

-3

(0 and 1)

0

-3

Data

false   true   (46012)

→ Bool →   0 | 1

Int   float   Char   ASCII   128

1, 2, 3   a, s, ...   0 - 127

{convert
binary system}   integer × 10^a

binary

1 → 1   10 → 1010   0, 1

0 → 0   {decimal ⇄ 1, 2, 3, 4,
2 → 10   binary }

3 → 11   0, 1   →

$$\nearrow \quad a^x$$

$$\boxed{9}$$

$$x \quad \underline{int}$$

$$\boxed{b}$$

$$\boxed{5}$$

$$int$$

$$\left(\frac{int}{int}\right) \to \underline{int}$$

$$a/b \to float$$

$$int / int \longrightarrow int$$

$$int / float \to \underline{float}$$

$$float / float \to \underline{float}$$

$$float / int \to \underline{float}$$

$$9/5 \to \boxed{1}$$

$$\to \boxed{1}$$

$$\left(\frac{9}{5}\right) \times C$$

$$(data\text{-}type) \; \underline{var}$$

$$\to \frac{9}{\to b} = \frac{9}{5} = \underline{1}$$

$$1 \times C \not\equiv \underline{1.8} \times C$$

$$int \; \boxed{b} \longrightarrow \quad . \frac{a}{(\underline{float}) \, b} .$$

$$= \underline{float}$$

$$float \to int$$

$$\boxed{lossy}$$

a

5.68+

5

int

5

$5.68+$
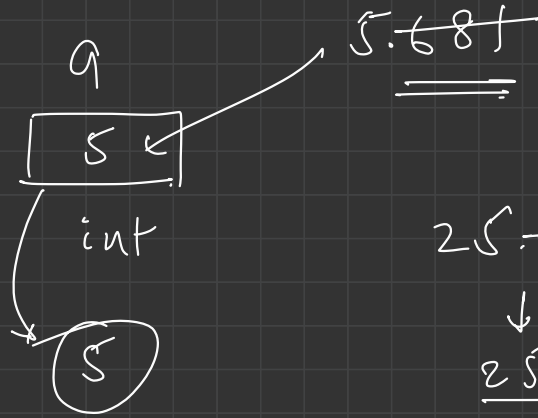
25.6143

25

25

$(float)\, a = \dfrac{5.0}{5}$

$\dfrac{25}{}$

```
if ( false ) {

    }                              → true
    else if ( __ ) {
        ⟵ __ __
    }
    else if(   ){
        (        )
    }
    else {        no — condition is written
        ⟵__ __ __ ⟶
    }
```
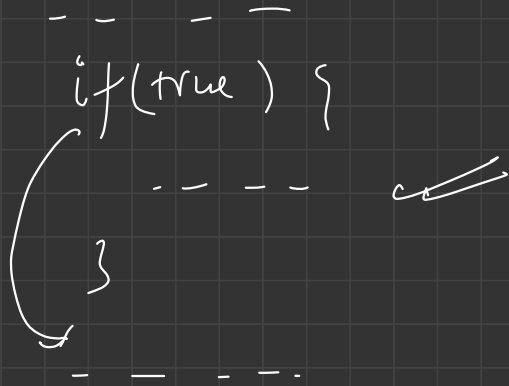
false

it
_____
else if
_____
else
_____

```
if (true) {

    ----        c<

    }

----  -  -
```

```
if ( ~~true~~ ) {
        ↙
    }

    else {
        ↙
    }
        →
```

```
if ( ~~false~~ ) {
    - - -

}
        true
else if ( => ) {
    ___

    }
```