

- Statements.

↳ expression → statement that has a result

1+2 ← expr

a = 1 ← not an expr

a == 1 ← expr

print(a) ← not an expression

- variables : objects that can be assigned a value.

a = 1

- objects : strings
numbers integers, float (reals), complex

integers are represented exactly

$$n = (-1)^{\text{sgn } n} \sum_{i=0}^{\log_2 n} b_i 2^i \quad \text{where } b_i = 0 \text{ or } 1$$

(base 2 representation of n)

ex $-8 = (-1)^1 (0 \cdot 2^0 + 0 \cdot 2^1 + 0 \cdot 2^2 + 1 \cdot 2^3)$
 $-8 = [-1 \ 0 \ 0 \ 0 \ 1]$

floating points are approximated by expression

of the form $(-1)^s \cdot 2^m \cdot \left(\sum_{i=0}^{\infty} c_i \left(\frac{1}{2}\right)^i \right)$

where $s, m, c_0 - c_n$ take value 0 or 1

- **containers** : object that contains other objects.

ex a string is a container of characters

`a = 'hello'` `a[0] = 'h'`

$$a[1] = e^1$$

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→ indexing : for ordered container, accessing
content directly

ex strings are ordered
lists 'hello' ≠ 'theol'
 $[1, 2, 3] \neq [3, 2]$

sets are not ordered $\{1, 2, 3\} = \{1, 3, 2\}$

solve $ax^2 + bx + c = 0$ (with $a \neq 0$)

discriminant = $b^2 - 4ac$

If discriminant > 0 then

$$x_1 = \frac{-b - \sqrt{\text{disc}}}{2a}$$

$$x_2 = \frac{-b + \sqrt{\text{disc}}}{2a}$$

If discriminant $= 0$ then

$$x_1 = -\frac{b}{2a}$$

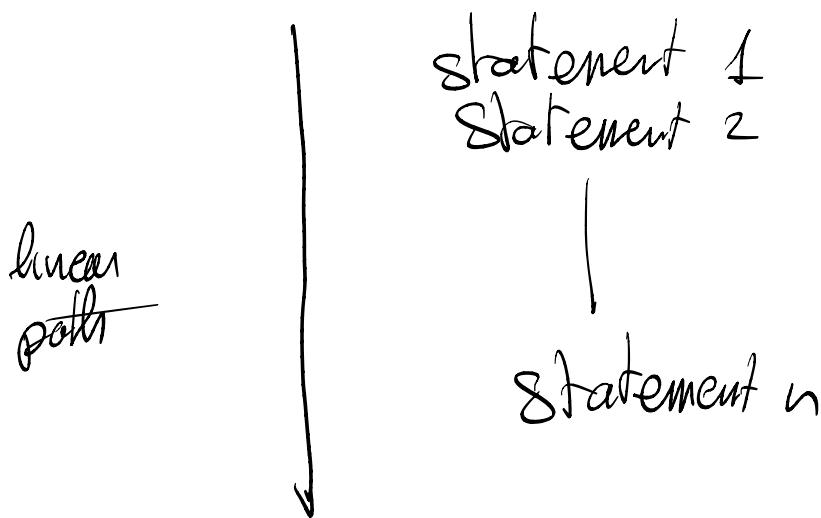
If discriminant < 0 , then

no real roots

$$-\frac{b}{2a}$$

$$-b/2/a$$

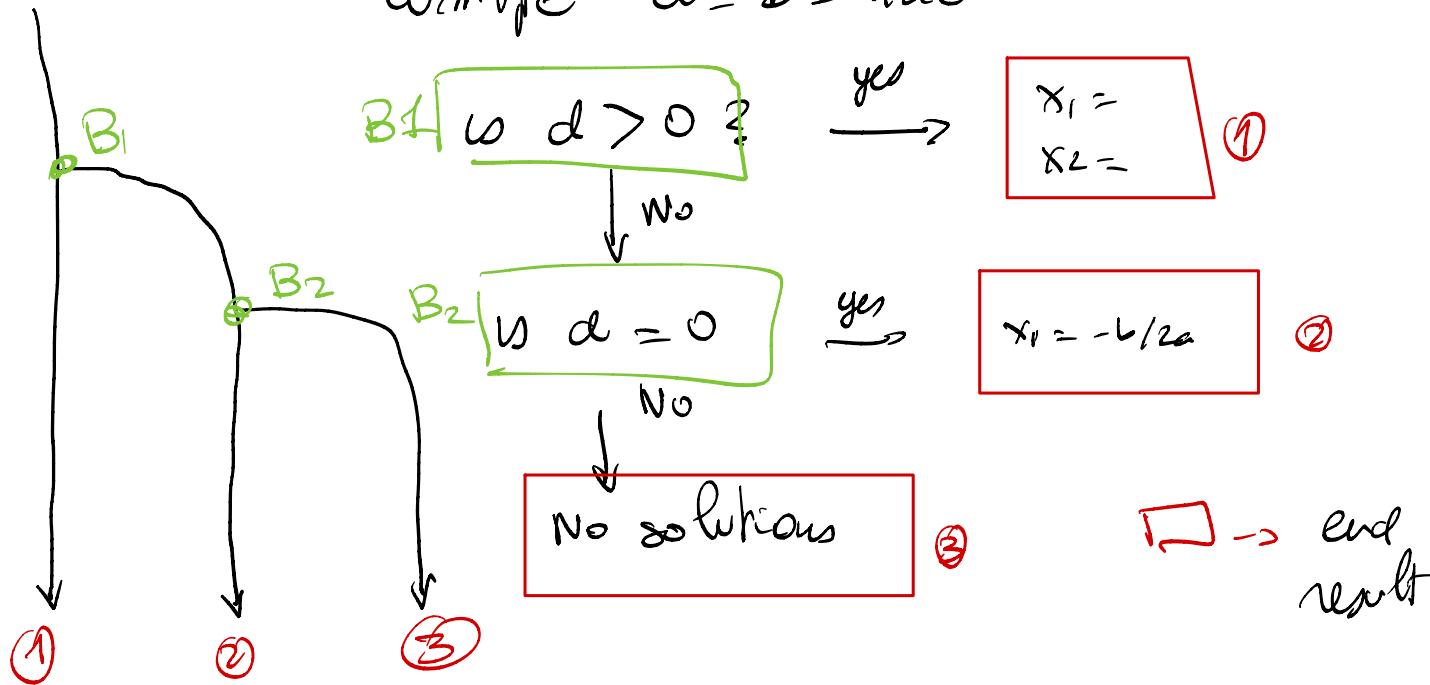
Branching / conditionals / tests

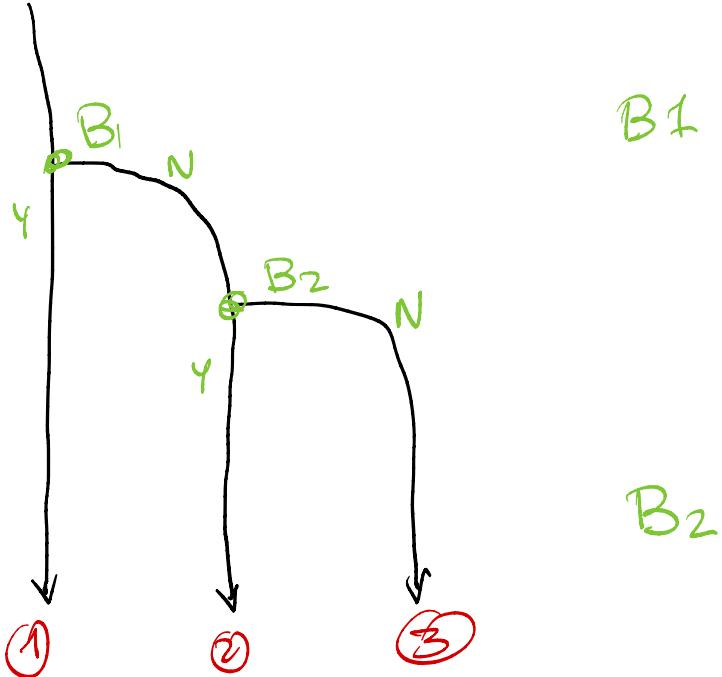


Quadratic formula

a, b, c

compute $d = b^2 - 4ac$





B1

B2

< statements >

if < condition > :

→ < statements >

→ < end ① >

else:

if

< conditions > :

< statements >

< end 2 >

elif

< statements >

< end 3 >