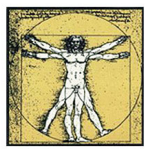
Lesson 6 - Boolean logic and iterations

Logical Computational Thinking

Stefano MARTINA

stefano.martina@gmail.com

Tecnológico de Monterrey

 Scuola Leonardo Da Vinci (Firenze)

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Boolean logic

Predicate

A function

$$P : X \to \{true, false\}$$

from a certain set X (for istance $\mathbb{R} \times \mathbb{R}$) to a truth value. Can be: `<` , `>` , `<=` $(\leq)$, `>=` $(\geq)$, `==` $(=)$, `!=` $(\neq)$

Logical connective

Technically predicates in the set: $\{true, false\} \times \{true, false\}$ ($\{true, false\}$ for the negation), can connect different expressions together. can be: `&&` $(\wedge)$, `||` $(\vee)$, `!` $(\neg)$.

a	b	$\neg a$	$a \wedge b$	$a \vee b$
0	0	1	0	0
0	1	1	0	1
1	0	0	0	1
1	1	0	1	1

Boolean expression

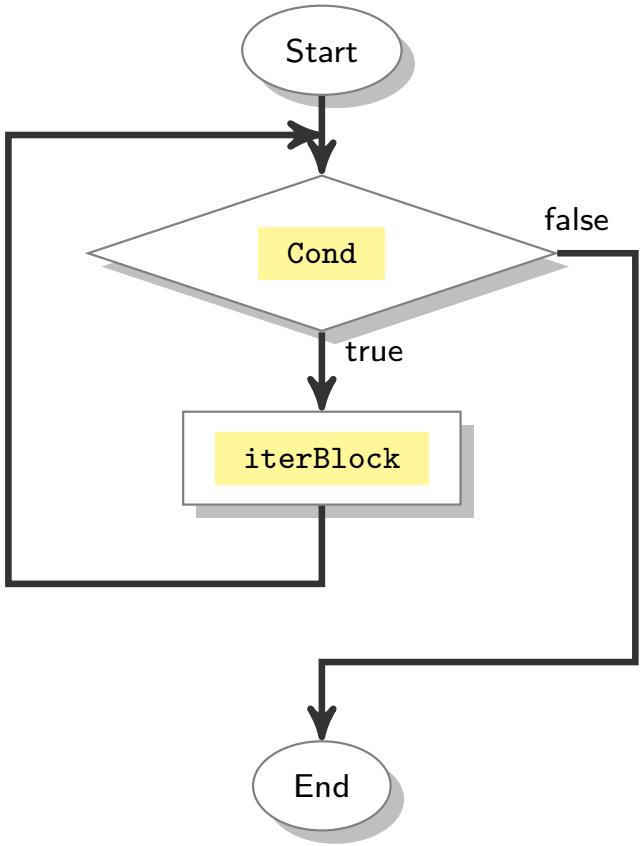
An expression that produce a boolean value when evaluated (true, false).
Can be composed from

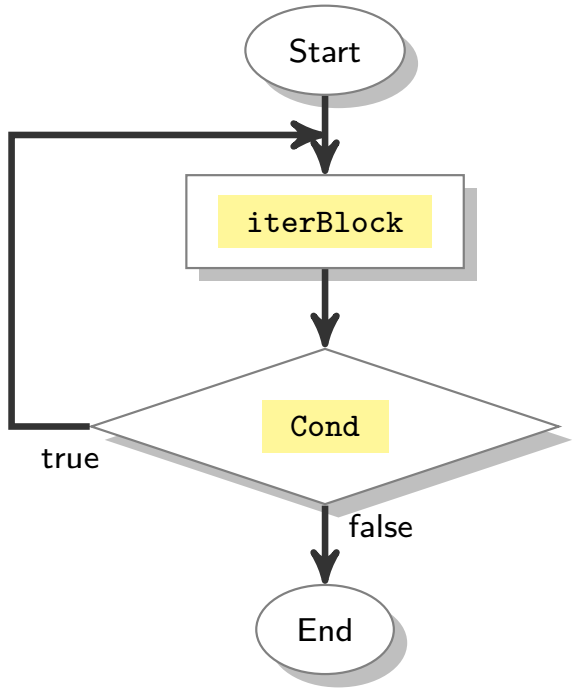
- ✓ variables
- ✓ predicates
- ✓ connectives
- ✓ parenthesis

for instance:

- ✓ `a<3`
- ✓ `(a>5) && (a<10)`
- ✓ `(a<b) || !(a>=10 && b<=5)`

Iterations


Start
Cond
false
true
iterBlock
End


Start
iterBlock
Cond
true
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