

Introduction to Pseudocode

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Motivation

- describe programs
- independent of programming language
- intentionally as simple as possible

Definition

Pseudocode is an informal, high-level description of the operation of a computer program or other algorithm

Implications

- use simplest way to describe things
 - even if that is in English
- not executable by a computer
 - walk-through by humans
 - reasonable

Variable assignment

Variable assignment is indicated by the \leftarrow symbol:

$x \leftarrow 1$

Variables in pseudocode do not need to be declared

Sequencing

Vertical space

Statements separated by vertical space happen in sequence

$x \leftarrow 1$

$y \leftarrow x$

$x \leftarrow 2$

What value does x have after this? What about y ?

Semicolons

Space sometimes gets tight, and more than one thing needs to go on a line. Semicolons separate statements in a sequence:

$x \leftarrow 1; y \leftarrow x; x \leftarrow 2$

Conditionals

if

Use **if then** to decide whether to do a sequence or not; end the sequence with **end if**

$x \leftarrow 0$

if $x > -6$ **then**

$x \leftarrow x + 1$

end if

What value does x have after this?

Conditional Operators

Use mathematical notation (not code notation) in pseudocode:

- $=, <, >$
- \leq, \geq (not $<=, =>, >=$)
- \vee, \wedge, \neg

Conditionals

else

Use **else** to delimit a sequence to execute if the conditional is **not** true

$x \leftarrow 0$

if $x > 17$ **then**

$x \leftarrow x + 1$

else

$x \leftarrow x - 1$

end if

What value does x have after this?

Conditionals

else if

Define chains of conditionals using **else if**. At most one of the sequences is executed.

$x \leftarrow 0$

if $x > 3$ **then**

$x \leftarrow 5$

else if $x > -3$ **then**

$x \leftarrow 7$

else if $x > -8$ **then**

$x \leftarrow 9$

else

$x \leftarrow 11$

end if

What is the value of x after this?

Work

1. Reading

- CLRS, section 2.1
- DPV, sections 0.1, 0.2

2. Quiz

- available now on learn.gold
- open until 16:00 Friday 12th October
- try multiple times
- mark is $30 + 70 \times (\text{score}/10)^2$