LibreLogo

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Logo: born to teach

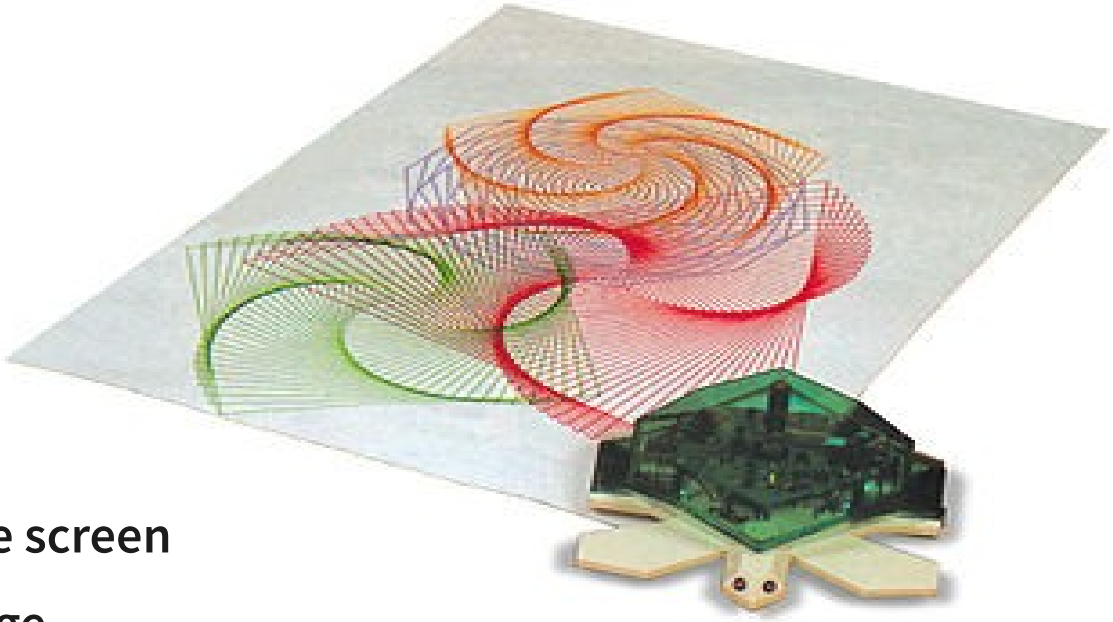
The Logo language
- born in ‘67
- initially without turtle,
  later added by Papert in ‘70

as a physical robot, later simulated on the screen

Easy to write, inspired by the Lisp language, created for numerical AND textual manipulation

Has inspired the Smalltalk language and the eToys system (and now Scratch) and the Kojo system (in a future lesson)

Papert (one of the fathers of Constructivism) posed that by teaching how to solve a problem to a computer, kids will learn how to think and understand better the problem



Many Logo implementations

LibreLogo: a mini Logo in your text-editor (today)

NetLogo and NetLogo 3D (later)

FMSLogo: fmslogo.sourceforge.net

Browser-based:

- Papert: ~~logo.twentygototen.org~~ (broken)
- Malt2: etl.ppp.uoa.gr/malt2 (3D turtle)
- www.logointerpreter.com (broken)
- www.calormen.com/jslogo

QLogo: qlogo.org(QT-based)

...

LibreLogo Language features

LibreOffice
The Document Foundation

LibreLogo: a small Logo in your word-processor

Turtle graphics

Global and local variables
Full recursive functions
Data types: word, list, array, number (but no static typing)
...

Adds: (it's converted to Python and runs in pyUNO) (HELP)
- interface to Python (code, sets, dicts, lists, tuples, sorted ...)

Removes from true Logo:
- list-based functional programming with anonymous functions

Some LibreLogo syntax

```
TO function_name arg1 arg2 arg3
    instructions
    OUTPUT return_value
END

IF test
    [ code if true ]
    [ code if false ]
```

NOTICE:

lists use [] WITHOUT space

programs use [ ] WITH space

```
REPEAT N [
    code
]

FOR var IN [list] [
    code
]

WHILE test [
    code
]
```

CONTINUE, BREAK, REPCOUNT can be used in loops

Programming style

Imperative/procedural <u>single-threaded</u>

(but other Logo implementations have <u>concurrent agents</u>)

<u>Functional</u> application of anonymous functions to lists (in full Logo)

map/filter/accumulate/reduce/…

Very readable syntax (no parentheses if unambiguous)

- the parser looks for function calls FROM RIGHT TO LEFT

E.g. a b c d e = a(b(c(d(e))))

The <u>functional</u> style allows for very readable code (see also Scala)

Why LibreLogo?

Yes, it’s limited, but still useful. You could:

- Generate drawings just in your editor (with turtle graphics)
- Show how to manipulate texts/poems in your editor
- Implement grammar rules
- Generate texts/poems/limericks (next)
- ...

Demo 1: Create a Limerick generator

[from “Lingua coding e creatività”, Stefano Penge]

A limerick is a humorous poem (often dirty) consisting of five lines

A	7-10 syllabes, same verbal rhythm A, same rhyme A
A	7-10 syllabes, same verbal rhythm A, same rhyme A
B	5- 7 syllabes, same verbal rhythm B, same rhyme B
B	5- 7 syllabes, same verbal rhythm B, same rhyme B
A	7-10 syllabes, same verbal rhythm A, same rhyme A

There was a small boy of Quebec,	A (8)	
Who was buried in snow to his neck;	A (9)	
When they said. “Are you friz?”	B (6)	
He replied, “Yes, I is —	B (6)	
But we don’t call this cold in Quebec”	A (9)	(by R. Kipling)

A limerick often: (DEMO)

Speaks about somebody	(person)
With some strange characteristics	(adjective)
From a place/city	(origin)
Who at a certain time	(when)
Wanted to do something	(desire)
But something else happens	(event)
Then a different outcome arise	(outcome)
“For that (person) from (origin)”	closing verse

IDEA: randomly choose the needed parts from lists for each verse

BUT: we should handle agreement of person & origin in verses (DEMO 2)

(what about rhymes? how?)

A limerick generator: example output

person adjective "from" origin	A red-headed surgeon from Milan
when desire 'in' place	Yesterday fell asleep on the Dome
"but" event	But after 3 hours
outcome	He remained aside
"that" person adjective "from" origin	That small surgeon from Milan

There is still some incoherence … we didn't handle agreement of adjective

Demo 2

Example 2: choosing the correct article for an italian word

Type:	definite/indefinite	(determinativo/indeterminativo)
Gender:	male/female	
Number:	singular/plural	

1) deduce the word's <u>gender</u> from final char (very rough approximation!)

2) select the proper <u>number</u> from final char ‘’

3) handle <u>N</u>ormality and <u>E</u>xceptions (here for <u>indefinite male singular</u> only)

N - starts with vowel	→ ”un”
E - starts with 2 special vowels (‘ia’, ‘ie’, ‘io’, ‘iu’)	→ “uno”
N - starts with consonant	→ “un”
E - starts with 1 or 2 special consonants	→ “uno”

(“x”, “y”, “z”, “gn”, “cn”, “pt”, “ps”, “pn”, “sc”, “sf”, “sq”, “st”)

Demo

DEMO