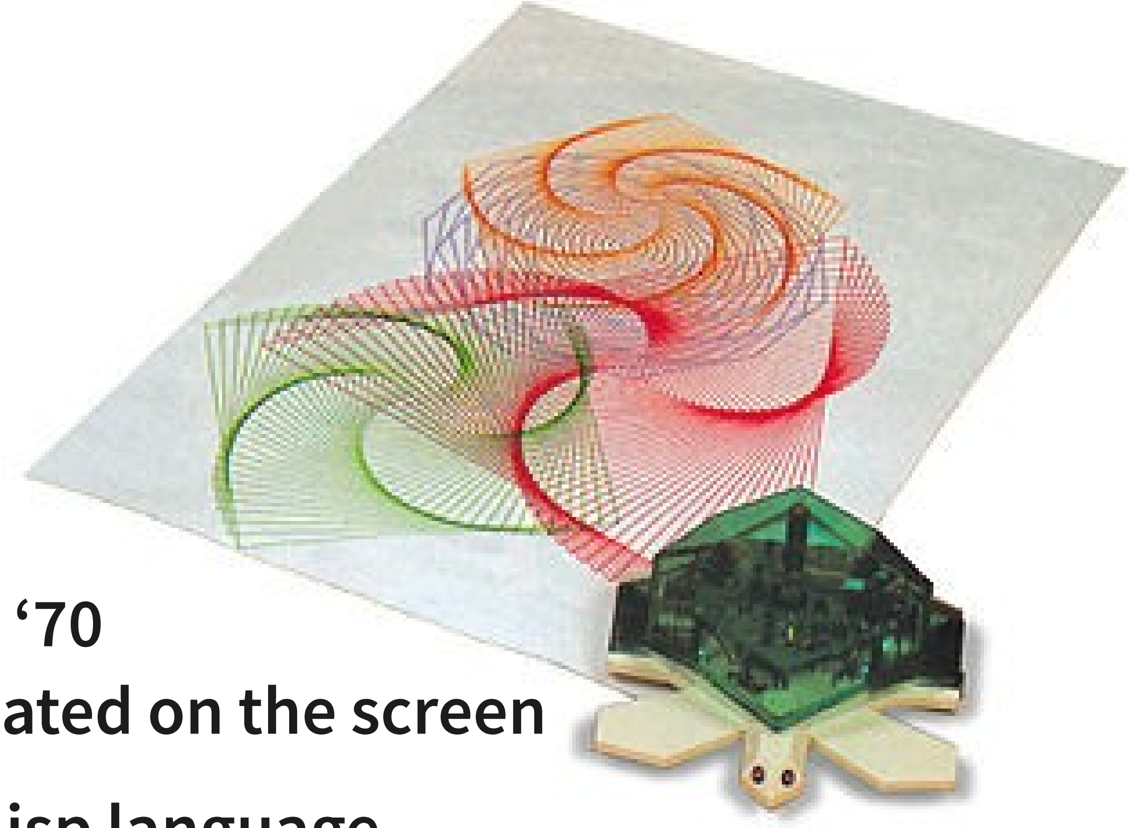
LibreLogo

Andrea Sterbini – sterbini@di.uniroma1.it

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

Many Logo implementations

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

NetLogo and NetLogo 3D (later)

FMSLogo: fmslogo.sourceforge.net

Browser-based:

- Papert: logo.twentygototen.org
- Malt2: etl.ppp.uoa.gr/malt2
- www.logointerpreter.com
- www.calormen.com/jslogo

QLogo: qlogo.org (QT-based)

...

LibreLogo Language features

LibreLogo: a small Logo in your word-processor

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:
- list-based functional programming with anonymous functions

Some LibreLogo syntax

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

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

```
REPEAT N [
    code
]

FOR var IN [ list] [
    code
]

WHILE test [
    code
]
```

CONTINUE, BREAK, REPCOUNT can be used in loops

Programming style

Imperative/procedural single-threaded

(but other implementations of Logo have concurrent agents)

Functional application of anonymous functions to lists (in full Logo)

map/filter/accumulate/reduce/…

Very readable syntax (you don’t need 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 functional style allows for very readable code (see also Scala)

Demo 1
Create a Limerick generator

A limerick is a humorous poem 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)

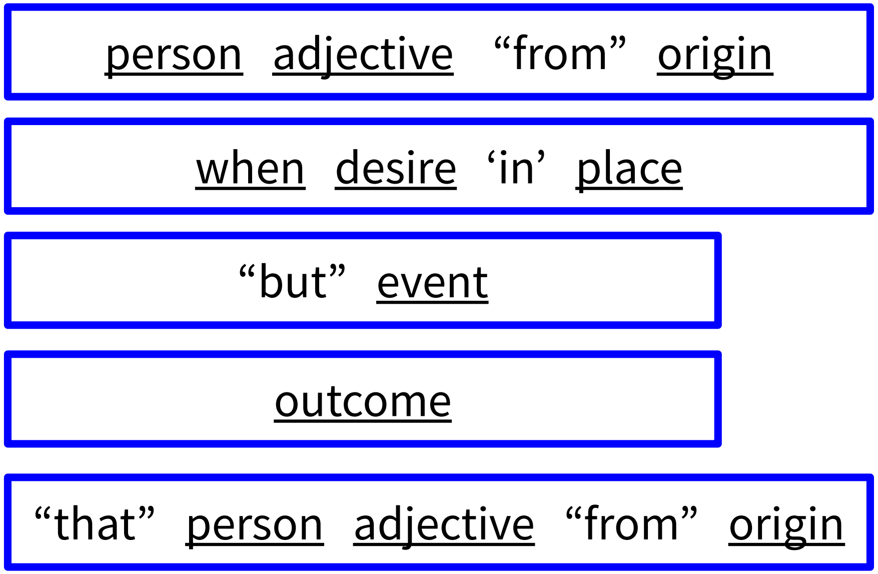
A limerick often: (DEMO)

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)”	

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

BUT: we should handle agreement of person and origin between verses (and rhyme structure) (DEMO 2)

A limerick generator:



person adjective “from” origin

when desire ‘in’ place

“but” event

outcome

“that” person adjective “from” origin

A red-headed surgeon from Milan
Yesterday fell asleep on the Dome
But after 3 hours
He remained aside
That small surgeon from Milan

Demo 2
choosing the correct article for an italian word

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

1) deduce the word gender from final char

2) select proper gender/number from final char

3) handle normality and exceptions (here for ind. male sing. only)

- starts with vowel → ”un”
- starts with consonant → “un”
- starts with 2 special vowels (‘ia’, ‘ie’, ‘io’, ‘iu’) → “uno”
- starts with 1 or 2 special consonants → “uno”
  (“x”, “y”, “z”, “gn”, “pt”, “ps”, “pn”, “sc”, “sf”, “sq”, “st”)

Demo

DEMO