

 EEL5840: Elements of Machine Intelligence
subjugator 2006


Announcements



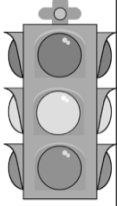
- Today's Handouts (see website):
 - > Outline Class 4
 - > LISP Notes 1
- Web Site
 - > www.mil.ufl.edu/5840
 - > Software and Notes
- Reading Assignment:
 - > Nilsson Chapter 3
 - > LISP Chapters 1-5
- Written Assignment Reminder
 - > Homework 2 due Tue. 9/8 in class



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Today's Menu



- Introduction to the AI Language LISP
- LISP
 - > Chapter 2 Basic LISP Primitives
 - > Chapter 3 Procedure Definition & Binding
 - > Chapter 4 Predicates & Conditionals

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The AI Language LISP

- LISP - LISt Processing Invented in the late 40's by John McCarthy at MIT on an IBM 709 computer.
- LISP is about symbolic processing, i.e., symbol manipulation is treating the binary quantities inside the computer like the words and sentences of a language. The words in LISP re called *atoms*. The sentences are called *lists*. Collectively atoms and lists are called *symbolic expressions* or *s-expressions* or *SEX* for short.
- Examples:

(arroyo	(professor ece)
	(degree phd)
	(area (ce robotics)))
(trip	(gainesville tallahassee 150)
	(tallahassee perry 50)
	(perry gainesville 100))

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The AI Language LISP

- Uses of LISP
 - > Expert Problem Solvers
 - > Commonsense Reasoning
 - > Learning
 - > Natural Language Interfaces
 - > Education and Intelligent Support Systems
 - > Speech and Vision
 - > The premier symbolic processing language is Common LISP
- Myths
 - > LISP is slow
 - > LISP programs are big
 - > LISP is hard to learn
 - > LISP is hard to debug & read because all those parentheses

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The AI Language LISP

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- Tutorial Introduction to LISP
 - > XLISP is available from stat.umn.edu by David Betz & Luke Tierney
 - > We have the latest 16-bit & 32-bit version on www.mil.ufl.edu/eel5840
 - > Install using winzip, pkunzip or in a fresh directory by running the self-extracting file.
 - > Go to the XLISP-STAT resources link to obtain additional information including a manual, the UNIX version and the MAC version.

```

    graph TD
      Input[Input] --> Eval[Eval]
      Eval --> Objects[Objects]
      Objects --> Atoms[Atoms]
      Objects --> Lists[Lists]
      Atoms --> Numeric[Numeric]
      Atoms --> Alpha[Alpha]
      Objects --> Eval
  
```

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LISP Lab 1

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Predicate Functions:

<i>(atom sex)</i>	t if sex is an atom
<i>(null sex)</i>	t if sex is nil or ()
<i>(eq sex1 sex2)</i>	t if sex1==sex2 (identical)
<i>(equal sex1 sex2)</i>	t if sex1=sex2
<i>(zerop sex1)</i>	t if sex=0
<i>(numberp sex)</i>	t if sex is a number
<i>(symbolp sex)</i>	t if sex is a symbolic atom
<i>(listp sex)</i>	t if sex is a list
<i>(member sex lis)</i>	nil if sex is not a member of lis

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LISP Lab 1

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LIST Functions:

<i>(car lis)</i>	returns the 1st sex of list "lis", same as <i>first</i>
<i>(cdr lis)</i>	returns the list "lis" with the 1 st sex removed, same as <i>rest</i>
<i>(car (cdr lis))</i>	same as <i>second</i> , i.e., 2 nd sex of the list "lis"
<i>(list sex1 sex2)</i>	returns the list (sex1 sex2)
<i>(cons sex1 lis)</i>	makes sex1 the 1 st element of the list "lis"
<i>(append lis1 lis2)</i>	a new list with all the elements of lis1 followed by all the elements of lis2

(defun fname (argument-list) <(forms)>)

(pprint (function-lambda-expression #'fname))

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*See Class 4 Notes &
LISP Tutorial 1
The End!*

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