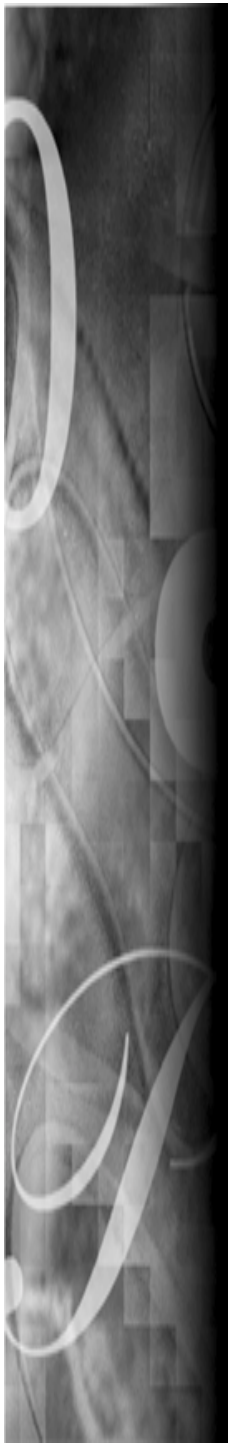
Allegro CL Certification Program

Lisp Programming Series Level I

Session 1

Homework



Hello World

- Create a source file, write a function that prints “Hello World”
- Save the file
- Compile the file
- Load the .fasl file
- Run the function

Arithmetic

- Write a function named polynomial
- It must take 4 arguments: a, b, c and x
- It must return the value of

  $ax^2 + bx + c$

My-compile-and-load

Write a function that compiles and loads a file of Common Lisp source code.

- Takes as argument a file
- Returns the symbol t

functions first, second, …, tenth

- first, second, third, …, tenth name functions each of which
  - takes a list as argument
  - returns the corresponding element of its list argument
- define a function which
  - takes as argument a list
  - returns a list of the second and fourth elements of its argument

function nth

- nth names a Common Lisp function which
  - takes as arguments a non-negative integer and a list
  - returns the element of its list argument which is in the (zero-based) position specified by the first argument
- as before define a function which
  - takes as argument a list
  - uses nth to return a list of the second and fourth elements of its argument

function nth cont'd

- define a function similar to that above which
  - takes as arguments 2 non-negative integer aand a list
  - returns a list of the elements of the list argument at the indices specified by the other 2 arguments
- modify the function defined above to also display the number of elements in the list arguments (use the length function)

function rest

- Just as first returns the first element of a list, the rest function returns that part of the list from which the first element has been removed

- define a function which takes as argument a list and returns a list of the result of calling first on the list argument and the result of calling rest on the list argument.

function member

- The member function
  - takes as arguments any lisp object and a list.
  - searches the list for a list element which is eql to the first argument
  - returns that part of the list of which the matching object is the first element
- define a function which calls member and returns that part of the list which follows the matching object

optional arguments to functions

- Define a function which
  - takes 2 required arguments and 2 optional arguments.
  - Prints each of its arguments
- Call the function with 2 non-integer arguments at least once
- Call the function with 3 arguments, not all of them integers, at least once
- Call the function with 4 arguments at least once

keyword arguments to functions

- Define a function doit which
  - takes 2 required arguments alpha and beta and 2 keyword arguments gamma and delta.
  - Prints each of its arguments
- make each of the following calls to the function
  - (doit 2 3)
  - (doit 2 3 :gamma 5)
  - (doit 2 3 :delta 7 :gamma 5)

rest argument to functions

- Define a function doit2 which
  - takes 2 required arguments alpha and beta and an &rest argument all-the-others
  - Prints each of its arguments
- make each of the following calls to the function
  - (doit2 2 3)
  - (doit2 2 3 5)
  - (doit2 2 3 ‘july 4 1776)
  - (doit2 3 4 5 6 7)