Adrian Velonis, Haley Nolan, and Maya Johnson
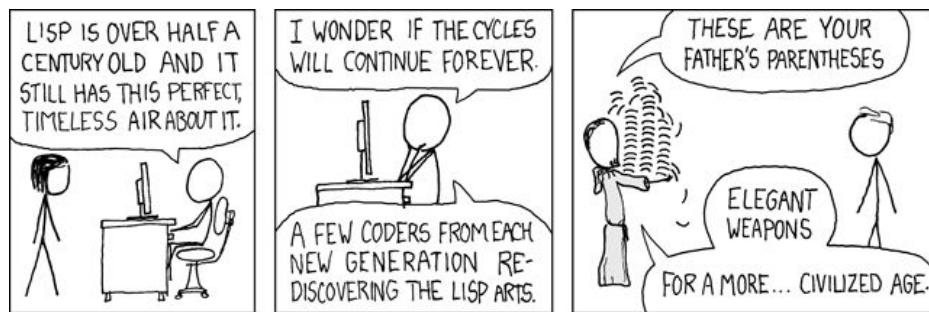Principles of Programming Languages
Deepak Kumar
September 21, 2020

Assignment #2

Lisp refers to a family of programming languages derived from the language LISP. Developed at MIT by John McCarthy in the late 1950s, it is the second-oldest high-level programming language after Fortran. The name "LISP" comes from the phrase "LISt Processor," as all expressions in the language are lists, and linked lists are one of its most significant data structures. Lisp is based on mathematical "lambda calculus" notation and was the first functional programming language. However, many dialects are general-purpose and include support for other paradigms, including object-oriented programming. Lisp began as a fully interpreted language; however, 1962 brought the first Lisp compiler, which allowed for the blending of interpreted and compiled functions in a model called incremental compilation.

The first implementation of Lisp was LISP 1, but the subsequent LISP 1.5 was its first widely used dialect. The dialect our group chose to focus on for this course is called Common Lisp, which was developed in 1984. Common Lisp is described as both functional and object-oriented. While its code can be written in an editor, many Common Lisp programmers choose to use IDEs, as they allow for a more sophisticated coding environment and are more accessible for general users. Common Lisp's incremental compiler allows for more dynamic operation, although it can support a pure interpreter as well.

Computations in Lisp are expressed as functions of a particular object: variables, data structures, or other functions. The syntax is heavily reliant on nested parentheses, with the first element serving as the function name and the following terms, separated by whitespace, serving as arguments. For example, the expression (/ (+ 3 5) 2) returns 4. The use of symbolic

expressions in Lisp contributed to the language's use in early AI research, although when AI

development shifted to for-profit the use of Lisp died off. Common Lisp is still used today; one

application you may be familiar with is the spelling and grammar checker Grammarly.

Works Cited

Common Lisp. Accessed September 20, 2020. https://lisp-lang.org/.

"Common Lisp." Wikipedia. September 08, 2020. Accessed September 17, 2020.

      https://en.wikipedia.org/wiki/Common_Lisp.

Hayes, Brian. "The Semicolon Wars." American Scientist. July 10, 2019. Accessed September

      17, 2020. https://www.americanscientist.org/article/the-semicolon-wars.

"Lisp (programming Language)." Wikipedia. August 13, 2020. Accessed September 17, 2020.

      https://en.wikipedia.org/wiki/Lisp_(programming_language).

Rouse, Margaret. "What Is LISP (list Processing)?" WhatIs.com. September 21, 2005. Accessed

      September 17, 2020. https://whatis.techtarget.com/definition/LISP-list-processing.