Programming Languages and Compilers: Quiz #7

Due on March 15, 2024 at 3:10pm

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Problem 1

Read the article "Lisp Scheme Differences" and summarize into 3 major different points between Lisp (or Common Lisp) and Scheme

Solution

1.**Syntax**:

- **Scheme**: Scheme's syntax is simpler and more consistent compared to Lisp. All expressions in Scheme use prefix notation, which simplifies and unifies its syntax. Scheme uses a single namespace for all variables.
- **Lisp**: Function calls use prefix notation, but it does not employ infix notation like C or Python. Both languages make extensive use of parentheses. Lisp uses separate namespaces for functions and variables (often referred to as the "Lisp-1 vs. Lisp-2" debate).

2.**Data Types**:

- **Scheme**: The data type system is simpler, generally treating all numbers uniformly. However, modern Scheme standards (such as R6RS and R7RS) do distinguish between integers, rationals, reals, and complex numbers. Scheme uses a unified type for characters, but treats strings as a distinct type.
- **Lisp**: It has a more complex and comprehensive type system, distinguishing between various numeric types (integers, floating-point numbers, rationals, and complex numbers) as well as between characters and strings.

3.**Standard Libraries**:

- **Scheme**: The standard library is smaller and more minimalist, focusing on essential functions. This minimalism is a deliberate design choice to keep the core language simple and lightweight.
- **Lisp**: The standard library includes many additional functions and features, providing more built-in support for various programming tasks out of the box.