CScharf - The Language Design

Model of Computation

CScharf is a multi-paradigm language which is primarily imperative – based on a Turing machine.

Language Paradigms

While CScharf was built to be a primarily object-oriented language, it supports procedural programming too. Its type system applies a mix of strong and dynamic typing; dynamic to make some aspects of the language easier to newer programmers, and strict to make the language easier to understand as each mention of a type serves as a bit of documentation.

To expand on this, the typing of primitive types is similar to what is seen in C# (e.g. int val = 10, long x = 1000L;) but more complex types are typed based on a generic form of their type (e.g. instance square = new Square(), array values = new int[10]).

Rules of Syntax and Identifiers

Syntax

CScharf shares a lot of its rules regarding syntax and grammar with C# such as requiring semicolons at the end of statements, and the syntax of aspects such as functions. Examples of syntax for variables, functions, classes, and interfaces are provided below:

Variable:



Function:



Interface:



Class:



Identifiers

boxCar

## Semantics: Types, Variables, and Values

Types

In CScharf there are many primitive types with native support in the language, these types are: integer (int), floating point (float), boolean (bool), string (string), anonymous type (anon), function (func), array (array), class instances (instance), java classes through reflection (reflection).

Additionally, functions can return any of these types, as well as having no return type by using void in place of a type.

Lastly, there are two modifiers that can be applied to variables: const and readonly. Constant variables must be supplied a value, and readonly variables can only be modified in class constructors. More information will be provided in the Variables section.

Variables

Variable declarations and definitions have the following structure:

[modifier] <type> <identifier> = <value>

Constant and readonly variables are supported in CScharf with the difference being that constant variables cannot be declared so must be given a value (defined), and readonly variables can only be modified in the constructor of a class.