



Sushi++ - Language grammar and description

COMPILERS

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1 Introduction?

2 Description

Sushi++ is a mostly functional language, enhanced with a few features belonging to the imperative paradigm.

2.1 Features

Here is our list of features presented in a decreasing order of priority:

1. Anonymous function,
2. Closure: a function will be able to capture a variable or a function from a higher scope,
3. Delimiter of end of line: `\n (...)`,
4. Full type inference,
5. Type hinting: allow the user to specify the type of a function parameter,
6. Built-in datastructures: array, list and tuple,
7. Usage of language C to use a few function,
8. Simple garbage collector: to clean the memory after the usage of built-in datastructures.
9. Packages: functions could be declared in namespaces/packages.

2.2 Keywords

The keywords of this language are inspired from the lexical field of sushi food. We have:

- **maki**: declaration of a variable or a named function.
- **soy**: declaration of an anonymous function.
- **roll**: while loop.
- **for**: for loop.
- **continue**, **break**: loop iteration control.
- **if-elseif-else**: conditional structure.
- **menu**: switch structure.
- **nori**: return.
- **to**: list "constructor".
- **Types**: `int`, `float`, `string`, `array`, `list`, `tuple`
- **mat**: define a package. This is not taken into account yet, but will be considered if time allows it.

2.3 Built-in datastructures

We consider to implement 3 types of datastructure of which the behavior will be defined based on 3 properties:

- **Structure mutability**: it is mutable if items can be added and removed after the creation of the datastructure,
- **Item mutability**: it is mutable if the items can be changed after the creation of the datastructure,
- **"Multityping"**: if the datastructure can contain elements of different types.

Name	Structure mutability	Item mutability	Multityping
array	Mutable	Mutable	Single type
list	Immutable	Immutable	Single type
tuple	Immutable	Mutable	Multiple types

Table 1: Properties of the datastructures

2.4 Operators

We decided to provide our language with the following operators :

- The assignment operators : = for a variable, : for a function,
- Some arithmetic operators : *, +, -, /, **, %, ,
- Some logic operators : ||, |, &, &&, ^, !
- Some comparison operators : ==, <, >, <=, >=, ,
- Some special operators : incrementation : ++, -- and concatenation : .