Logo

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Language Design and Implementation

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Bonsai Programming Language (Based on Sili)

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Introduction

This report is created to introduce a new programming language with the name Bonsai, in the future referred to as (BiPL). This language is conventional, built for general purpose for maths functions. Also, this language is based on the Sili language created by Dave Voorhis. For this reason, the Bonsai language is similar to the Java programming language but easier to read and simpler to use.

As a computational model for the developed language was used, imperative programming which is sequentially based on a Turing machine. That means that this language supports both imperative programming and procedural programming paradigms. The imperative paradigm allows using statements that are needed for the changing of the program state. To perform the program by the computer, the commands are necessary. These commands are contained in every imperative program.

An interpreter is used to translate a program (source code) written in BiPL into machine code. The interpreter converts the program into one statement simultaneously, which takes less time to process than a compiler, plus that way of code translation uses fewer memory resources.

The BiPL will be developed as a statically typed programming language. Also, this programming language (BiPL) is developed to use mutable variables which can be changed anytime after the creation.

**Implementation**

**Function:**

fn (arguments){

code

}

**For Loop**

for (i=1; i<=a; i=1+1){

code

}

**While Loop**

while(condition){

code

}

**if/else statements**

If (condition){

statement

}

else{

statement

}

**Print to console**

Print(value)

**Example of supported math functions for calculation:**

* Addition
* Subtraction
* Multiplication
* Division
* abs()
* ceil()
* sqrt() – square root function
* factorial ()
* floor()
* pow()
* PI
* sin()
* cos()
* tan()
* degrees()
* radians()

BiPL is a High-level language that provides numerous benefits compared to other languages, such as [more convenient](https://www.powerthesaurus.org/most_convenient/synonyms) reading and understanding developed code, making a job easier for developers. This lead to rapid(fast) development. Also, BiPL is ideal for Agile methodology, which is great for saving the company’s development expenses.