

ALACS

where Functional meets Object Oriented.

1. Introduction/Project Description

Alacs is a functional and object-oriented language. The goal of our project is to develop a functional language that incorporates some object oriented features such as inheritance polymorphism, and encapsulation. In short our language will be a lite version of Scala. Furthermore, we intend to expand upon inheritance by allowing for multiple inheritance classes. Alacs will also draw upon functional language aspects such as a preference of immutable objects instead of mutable. Every value will be an object similar to Scala's implementation.

2. Language Features

Data Types:

All data types will be immutable

num - all number types will be decimals, we will have no ints, or longs.

String - words or phrases that will be enclosed in quotes

A future goal of our program is to make it typeless where the compiler later figures out the type using the Hindley Miller Method.

Conditionals:

Conditional statements will comprise of If, Elseif, and Else

If(condition) { (statements) }		If(condition) { (statements) }
Elseif { (statement) }	OR	Else { (statement) }
Else { (statement) }		

Loops will comprise of just While loops

```
int i = 2;  
While (i<10) {  
    i= i+1;  
}
```

Operations: +, -, *, /, %, ==, !=, >, <, ==>, ==<

Typical programming operations will be supported.

Syntax:

Complete Statements:

Semicolons will be used to declare the end of a statement

Comments:

Comments will start with “/*” and end with “*/”

Blocks of Code:

Loops/functions will begin with an open curly brace and end in a close curly brace

Code Example: of Syntax and Language Structure

```
num b = 5.;
num c = 10.;
/*this will loop 5 times*/
while(b<c)
{
    b = b + 1.;
}
c = [0.,1.,2.,3.];
d = "Hello";
i = 0.;
while(i<4)
{
    print(c[i]);
    i = i+1;
}
```

Object Coach

```
{
    String name;
    num age;
}
```

Object Player

```
{
    num number;
    String position;
}
```

Object Team extends Coach and Player

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Data Structures: Our language will implement common data structures such as arrays, Arraylists, and tuples.

Array - is a container object that holds a fixed number of values of a single type, and a fixed length

ArrayList would be a dynamic data structure that represents list of objects that can be added or removed from the list. No fixed length

Tuples - a finite ordered list of elements that are immutable and do not necessarily relate to each other.

Interesting Project Application of Language:

Analytics is one of the rising trends in the sports industry. From baseball to basketball, every team wants to know the impact its players have on the game. By analyzing individual and team performances, coaches are better able to make adjustments and help their team win games. In addition, players are also able to better understand their strengths and weaknesses and how they impact their team from a statistical standpoint. This allows them to improve upon lacking areas and increase productivity while playing. Current languages are too data heavy and difficult for the average, everyday user who is not fluent in statistics to understand.