

Programming Languages
CSE 341

HW#3

Report

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Homework Content

In this homework I programmed a lisp like programming language with lisp and Yacc that have some specialties like

- Lisp like syntax

- Interpreted

- Imperative, non-object oriented

- Static scope, static binding, strongly typed, ...

A few built-in types to promote exact arithmetic for various domains such as computational geometry

After that, this document can be considered as user's manuel.

Starting with file

Run interpreter without input txt file

```
clisp gpp_interpreter.lisp
```

After run you can use gpp programming language

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>>
```

Run interpreter with input txt file

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp file.g++
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit
31/227
PS C:\Users\OmerF\Desktop\pl_hws\hw2>
```

file - Not Defteri

Dosya Düzenle Görünüm

```
((set a 31f454) (+ 321 234f232) (* a 2))
```

Addition

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit
```

```
>>> (+ (+ 213f123 234f34) 333)
```

```
238105/697
```

```
>>> (+ (+ 213f123 234f34) (+ 1212 333))
```

```
1082869/697
```

```
>>>
```

Multiplication

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit
```

```
>>> (- 123f213 (- (+ 9f324 213) 1))
```

```
-540467/2556
```

```
>>> (- 123f213 9)
```

```
-598/71
```

```
>>> (* 123f213 9)
```

```
369/71
```

```
>>> (* 123f213 (* 10 9))
```

```
3690/71
```

```
>>> (* 123f213 (* 10 (- 123 122)))
```

```
410/71
```

Substraction

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (- 123f213 (- (+ 9f324 213) 1))

-540467/2556

>>> (- 123f213 9)

-598/71

>>>
```

Function definition

```
>>> (defun a_function(a b) ((- a b)))

T
```

Function call

```
>>> ( a_function ( 3 4 ) )

-1

>>> ( a_function ( (+ 31 12) (- 213 12) ) )

-158

>>>
```

If else structure

```
>>> (if (eq 5 5) ((set a 321f123) (+ a 1f1)) ((+ 1 1)))

148/41

>>> (if (gt 5 5) ((set a 321f123) (+ a 1f1)) ((+ 1 1)))

2

>>>
```

Lexical Error

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (++) 213)))

"paranthese error"
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (++)321 123)

"Lexical Error"
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (++) 321 123)

"Lexical Error"
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (! 321 123)

"Lexical Error"
```

Static scope

```
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (set var_a 312)

312

>>> (eq var_a 312)

T

>>> (set var_a 31)

31

>>> (eq var_a 312)

NIL

>>>
```

Exit

```
PS C:\Users\OmerF\Desktop\pl_hws\hw2> clisp gpp_interpreter.lisp
Welcome to interpreter and lexical analyzer of the g++ that created by Omer F. Akduman
to quit input :exit

>>> (eq var_a 312)

NIL

>>> (set var_a 31)

31

>>> (eq var_a 312)

NIL

>>> ( exit )

"Exit normally"
PS C:\Users\OmerF\Desktop\pl_hws\hw2>
```

Resources

- 1- Stackoverflow
- 2- <https://common-lisp.net/>
- 3- Wikipedia
- 4- <https://lispcookbook.github.io/cl-cookbook.html>
- 5- Opengpt