

SDSU CS530 Fall 2013 Assignment #3

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Design, develop, and deliver a parser for expressions

Project Deadline: 1730, 9 Dec 2013

You may work on this project individually or on a team of 2 people (your choice).

Specification:

You shall develop a grammar and implement a parser which recognizes valid statements. Your program shall read input from a file named in.txt, scan the input, and determine if the statement(s) is/are valid. Your program shall print out the statement, and either pass/fail into a file named out.txt. If it failed, you shall print out why (in the same out.txt file).

Note: id ::= identifier, exp ::= expression, op ::= operator, char ::= character

Your compiler will recognize the following as valid statements:

- **assignment**
- **expression**

assignment shall have the form:

id = exp ;

expression shall have the form:

id op id {op id} -- any length as long as pairs of op and id are added

note - each id, op, =, and ; will have a space as it's precedent and antecedent.

An **id** shall be made up of any combination of **digits** and **char**. The first position of the identifier must contain a char

A **digit** is one of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

A **char** is one of a, b, c, d, e, f, g, h, i, j, k, l m, n, o, p, q, r, s, t, u, v, w, x, y, z, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

An **op** is one of:

+, -, *, /, %

The file ex.txt also posted in the assignment folder in the course's Blackboard contains examples of both good and bad statements

Additional Requirement for Teams of 2: parenthesis may be used to group any id op id combination. **NOTE -- this includes nested parenthesis. Therefore, the following are all valid expressions:**

- id op (id op id) op id
- id op id op (id op id)
- id op (id op (id op id))
- id op (id op (id op (id op id)))
- id op id op (id op id) op ((id op id) op id)

note - The open parenthesis will have a space as it's precedent but it may or may not have a space immediately following it. The converse is true for the closing parenthesis (guaranteed a space as it's antecedent but not necessarily preceding it).

Turning In Your Work:

When ready to turn this project in, use the turnin procedure posted on the course Blackboard

Development Environment:

You may develop your code using C, C++, Python, **lex/yacc**, **Flex/Bison**, Lisp, or any functional language or any combination of these...provided that you are using tools with the same versions found on rohan.

In addition to the normal requirements for your README file (see notes on Blackboard), your README file shall also contain:

- The grammar (use BNF) describing what a valid statement is
- Program inputs and program outputs

All other rules/instructions apply (name in every file, no cheating, etc).