**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**

Batch No. :

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS**

**Compiler Construction (CS F363)**

**II Semester 2017-18**

**Compiler Project (Stage-1 Submission)**

**Coding Details**

**(February 26, 2018)**

1. **Personal details**

ID 2014B5A70717P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name Vishal Golcha\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Files and folder details**
2. Mention the names of the Submitted files :

1 lexer.c 7 parse-tree.c 13testcase5.txt

2 ll-helper.c\_ 8 driver.c 14testcase6.txt\_

3\_lexer.h 9 \_testcase1.txt\_ 15 testcase7.txt\_

4\_lexerDef.h\_\_ 10\_testcase2.txt\_\_\_\_\_ 16 testcase8.txt

5\_parser.h\_\_\_\_ 11\_testcase3.txt\_\_\_\_\_ 17 corresponding result files\_\_\_\_\_

6\_parserDef.h\_\_\_\_\_\_\_\_\_ 12\_testcase4.txt\_ 18\_finalgm.txt

19 first\_sets.txt(automated gen) 20 follow\_sets.txt(automated generation)

21 makefile 22 parser.c 23 codingDetails

1. Total number of submitted files: \_21 + 8(result files)\_\_\_\_\_\_\_\_\_\_ (All files should be in ONE folder named exactly as your ID)
2. Have you compressed the folder as specified in the submission guidelines? (yes/no)\_yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **Lexer Details:**
   1. Technique used for pattern matching: \_\_\_\_DFA based if else statements ,with a global ptr that increases via get\_next() and decreases via retract() with a twin buffer .
   2. Keyword Handling Technique: HashTable made via linked lists
   3. Hash function description, if used for keyword handling: djb2 hash for strings

<http://www.cse.yorku.ca/~oz/hash.html> can be accessed from here .particularly effective for strings . Combined with an additional modulo 123 .

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Have you used twin buffer? yes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. Error handling and reporting (yes/No):\_\_yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. Describe the errors handled by you \_\_\_\_\_\_

1) function definition having at least one alphabet after underscore.

2) Unknown symbol after function or variable definitons or within string or numeric instances.

3) string name length exceeds 20 ;

4) error in string name improper var identifier termination . (if a string name ends with an unknown symbol)

5) string instance does not allow uppercase chars.

6) string instance does not terminate with double quotes

7) Lexical error : expected decimal values after decimal in some number.

8) Lexical error : no logical keyword between dots

9) expected a logical operator after dot, no dot termination however \_

10) Syntactic Errors

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Data Structure Description for tokenInfo (in maximum two lines): Has line number , token name and lexeme .\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Parser Details:** 
   1. High Level Data Structure Description (in maximum three lines each, avoid giving C definitions used)
      1. grammar : \_\_grammar rules have been populated as linked lists with structure containing a linked list with an lhs and and rhs node that can be used to access nodes further . A->BCD will have A as lhs and B->C->D as rhs . \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. parse table: simple two d array containing numbers for rules ,the first dimension is for non terminals and second dimension for terminals. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. parse tree: (Describe the node structure also) a node with three pointers parent sibling and child along with line number , the child and sibling nodes have been connected and turned into a list as discussed in class .

All the child nodes and sibling nodes are connected to a parent via the parent pointer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. Any other (specify and describe) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Parse tree
     1. Constructed (yes/no):\_\_\_yes\_\_\_\_
     2. Printing as per the given format (yes/no): \_yes \_\_\_\_\_\_
     3. Describe the order you have adopted for printing the parse tree nodes (in maximum two lines)

the inorder traversal prescribed on Nalanda child cur node remaining siblings of child\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Computation of First and Follow Sets
     1. Data structure for First and Follow sets \_\_\_Bitsets computed with long long int set ith bit as (1LL << i )
     2. FIRST and FOLLOW sets computation automated ( yes)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     3. Name the functions (if automated) for computation of First and Follow sets\_\_

1) traverse\_and\_compute\_first in parser.c : traverses a rule and computes

2) traverse\_and\_compute\_follow in parser.c traverses a rule and computes

3) populate\_follow\_sets in parser.c uses 2) for all rules

4) populate\_first\_sets in parser.c uses 1) for all rules

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. If computed First and Follow sets manually and represented in file/function (name that) \_\_\_none\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  1. Error Handling and recovery
     1. Attempted (yes/ no):\_\_\_\_yes\_\_\_\_\_\_\_\_
     2. Synchronizing set formation details\_\_\_\_\_formed using and first and follow heuristics mentioned in the book\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     3. Describe the types of errors handled \_\_\_\_\_parse table does not have an entry

and when terminals dont match\_, also non empty stack , pre emptive emptying of the stack before eof\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Compilation Details**
   1. Makefile works (yes/no):\_\_\_yes \_\_\_\_\_\_\_\_
   2. Code Compiles (yes/ no):\_\_\_\_\_yes \_\_\_\_\_\_\_\_\_
   3. Mention the .c files that do not compile:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_None\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Any specific function that does not compile:\_\_\_\_\_\_\_\_\_\_\_\_None\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Ensured the compatibility of your code with the specified gcc version(yes/no)\_\_\_\_\_\_yes\_\_\_\_\_\_
2. **Driver Details:** Does it take care of the options specified earlier(yes/no):\_\_\_\_yes

additional option to close the driver with option 5\_\_\_\_\_\_\_

1. **Execution details**
   1. status (describe in maximum 2 lines):\_\_\_\_\_\_\_\_\_\_\_\_complete execution no faults\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Gives segmentation fault with any of the revised test cases (1-5) uploaded on the course page. If yes, specify the testcase file name:\_\_\_\_\_\_no faults encountered\_\_\_\_\_\_\_\_

1. Specify the language features your lexer or parser is not able to handle (in maximum one line)\_\_\_\_lexeme value shouldnt be greater than 500 chars\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Lifeline detail:** Are you availing the lifeline (Yes/No):No
3. **Declaration**: I, \_\_\_\_\_Vishal Golcha\_\_\_\_\_\_\_\_\_\_\_\_\_ (your name) declare that I have put my genuine efforts in creating the compiler project code and have submitted the code developed only by me. I have not copied any piece of code from any source. If my code is found plagiarized in any form or degree, I understand that a disciplinary action as per the institute rules will be taken against me and I will accept the penalty as decided by the department of Computer Science and Information Systems, BITS, Pilani.

ID\_2014B5A70717P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_Vishal Golcha\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_26/2/18\_\_\_\_\_\_\_\_\_\_\_

-------------------------------------------------------------------------------------------------------------------------------------------------

/\*not to exceed two pages\*/