BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS
Compiler Construction (CS F363)
II Semester 2022-23
Compiler Project (Stage-1 Submission)
Coding Details
(March 2, 2023)

Group No.

6

1. IDs and Names of team members

   ID:_____2020A7PS0025P_____Name:_____Shaz Furniturewala_____

   ID:_____2020A7PS0067P_____Name:_____Niveditha Kovilath_____

   ID:_____2020A7PS0111P_____Name:_____Anshika Gupta_____

   ID:_____2020A7PS0112P_____Name:_____Sarthak Agarwal_____

   ID:_____2020A7PS1684P_____Name:_____Shreyas Shesham_____

2. Mention the names of the Submitted files :

1____lexer.c_____	7____ll1_gram.c_____	13__parserDef.h___	19_____adtDef.h_____
2____lexer.h_____	8____ll1_gram.h_____	14__grammarHash.h__	20____Makefile_____
3____parser.h_____	9____ll1_gramDef.h_____	15__grammarHashDef.h__	
4____parser.c_____	10____keywordTable.c____	16____driver.c_____	
5____grammarHash.c_	11____keywordTable.h____	17____adt.c_____	
6____lexerDef.h_____	12____keywordTableDef.h____	18____adt.h_____	

3. Total number of submitted files: _____ (All files should be in **ONE folder** named exactly as Group_#, # is your group number)

4. Have you mentioned your names and IDs at the top of each file (and commented well)? (Yes/ no) ____Yes__
   [Note: Files without names will not be evaluated]

5. Have you compressed the folder as specified in the submission guidelines? (yes/no)____Yes_____

6. **Lexer Details:**

   [A]. Technique used for pattern matching: _Pattern Matching is done using a switch case statement to check the appropriate lexeme for the next token_____

   _____

   [B]. DFA implementation (State transition using switch case, graph, transition table, any other (specify):____
   _____State transition using switch case_____

   [C]. Keyword Handling Technique: _____Hash Table search_____

   [D]. Hash function description, if used for keyword handling:_____Rolling polynomial Hash Function_____

   [E]. Have you used twin buffer? (yes/ no) _____Yes_____

   [F]. Lexical error handling and reporting (yes/No):_____Yes_____

   [G]. Describe the lexical errors handled by you ____Invalid Character after various tokens, Invalid characters, Comment Mark not closed_____

[H].Data Structure Description for tokenInfo (in maximum two lines):

_____linked list_____

[I]. Interface with parser _____Done, the token linked list is a global variable that is used in teh

parser_____

7. Parser Details:

[A]. High Level Data Structure Description (in maximum three lines each, avoid giving C definitions used):

i. grammar : _____Array of custom struct "lhs", size = number of rules. "lhs" contains the id of the non-terminal present on the lhs of each rule, a pointer to the first symbol on the rhs (custom struct) as well as the last symbol on the rhs._____

ii. parse table ____Array of ints of dimension Num-of-nonTerminals x Num-of-Terminals with each entry being a rule number._____

iii. parse tree: (Describe the node structure also) _____The parse tree contains a single tree node root. Each tree-node has a union that becomes equal to either a terminal or non-terminal. It has a bool to define which one the union stores. It also points to its parent, it's left child its right sibling and stores if it has been visited._____

iv. Parsing Stack node structure :_____Each stack node contains a union of either a terminal or non-terminal and a variable defining which one of these is stored. It also points to the next stack node and its own location in the parse tree._____

v. Any other (specify and describe) _the rhs struct contains the id of the rhs, along with a bool to determine if its a terminal or non-terminal. It also contains a pointer to the next rhs and the previous rhs.

[B].Parse tree

   i. Constructed (yes/no):__Yes__

   ii. Printing as per the given format (yes/no): _Yes_

   iii. Describe the order you have adopted for printing the parse tree nodes (in maximum two lines)

   _____Inorder traversal_____

   _____

[C].Grammar and Computation of First and Follow Sets

   i. Data structure for original grammar rules _____Array of custom struct lhs, which acts as the head of a double linked list of custom structs rhs._____

   ii. FIRST and FOLLOW sets computation automated (yes /no)_____Yes_____

   iii. Data structure for representing sets _____Array_____

   iv. Time complexity of computing FIRST sets _____O(NUM_of_RULES^2*NUM_of_Terminals)

     v.   Name the functions (if automated) for computation of First and Follow sets_____

               _____computeFirstandFollow()_____

     vi. If computed First and Follow sets manually and represented in file/function (name that) _____

               _____loadFirstAndFollow()_____

[D]. Error Handling

     i. Attempted (yes/ no):____Yes____

     ii. Printing errors (All errors/ one at a time) :_____Yes_____

     iii. Describe the types of errors handled

         _____Input remaining, stack empty; Terminal mismatch; non-terminal doesnt exist; Linked empty,

         Stack not empty_

         _____

     iv. Synchronizing tokens for error recovery (describe): We have implemented a retraction function

         after developing a synchronization set for all non-terminals

     v. Total number of errors detected in the given testcase t6(with_syntax_errors).txt

               _____10_____

8. Compilation Details:

    [A]. Makefile works (yes/no):__Yes____

    [B]. Code Compiles (yes/ no):__Yes_____

    [C]. Mention the .c files that do not compile: N/A_____

    [D]. Any specific function that does not compile: N/A_____

    [E]. Ensured the compatibility of your code with the specified gcc version(yes/no)____Yes_

9. Driver Details: Does it take care of the options specified earlier(yes/no):__Yes___

10. Execution

    [A]. status (describe in maximum 2 lines):_____Running_____

    _____

    [B].   Execution time taken for

        • t1.txt (in ticks) _____ and (in seconds) ___0.016s_____

        • t2.txt (in ticks) _____ and (in seconds) _____0.033s_____

        • t3.txt (in ticks) _____ and (in seconds) _____0.058s_____

        • t4.txt (in ticks) _____ and (in seconds) _____0.043s_____

        • t5.txt (in ticks) _____ and (in seconds) _____0.111s_____

        • t6.txt (in ticks) _____ and (in seconds) ___0.074s_____

    [C].   Gives segmentation fault with any of the test cases (1-6) uploaded on the course page. If yes, specify the

    testcase file name:_____

11. Specify the language features your lexer or parser is not able to handle (in maximum one line)__All specifications are being handled, _____

_____

12. Are you availing the lifeline (Yes/No): ___Yes____

13. Declaration: We, _____Shaz Furniturewala, Nivethida Kovilath, Anshika Gupta, Sarthak Agarwal and Shreyas Shesham_____ (your names), declare that we have put our genuine efforts into creating the compiler project code and have submitted the code developed only by our group. We have not copied any piece of code from any source. If our code is found plagiarized in any form or degree, we understand that disciplinary action as per the institute rules will be taken against us and we will accept the penalty as decided by the department of Computer Science and Information Systems, BITS, Pilani. [Write your ID and name below]

ID:_____2020A7PS0025P_____Name:_____Shaz Furniturewala_____

ID:_____2020A7PS0067P_____Name:_____Niveditha Kovilath_____

ID:_____2020A7PS0111P_____Name:_____Anshika Gupta_____

ID:_____2020A7PS0112P_____Name:_____Sarthak Agarwal_____

ID:_____2020A7PS1684P_____Name:_____Shreyas Shesham_____

Date: _13/03/2023_

Should not exceed 4 pages.