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

_____

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_____

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ID:_____2020A7PS0111P_____Name:_____Anshika Gupta_____

ID:_____2020A7PS0112P_____Name:_____Sarthak Agarwal_____

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Date: _13/03/2023_

Should not exceed 4 pages.