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

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS**

**Compiler Construction (CS F363)** 

**II Semester 2024-25**

**Compiler Project**

**Coding Details**

**(March 15, 2025)**

1. Team Members Names and IDs

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS1171P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_SAMRATH SINGH KHANUJA\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS1175P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_VIRENDRASINH MANE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS0124P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_VISHNU CHEBOLU\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS0115P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_\_SHASHWAT GOYAL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS0111P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_\_PARTHIB SARKAR\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_2022A7PS1187P\_\_\_\_\_\_\_\_\_\_\_\_\_Name\_\_\_\_\_HARSIMAR SINGH SALUJA\_\_\_\_\_\_\_\_\_\_\_\_

1. Mention the names of the Submitted files :

1\_\_\_\_\_\_README.md\_\_\_\_\_\_ 7 keyword\_table.h 13 lexer.h

2\_\_\_keyword\_tableDef.h 8 driver.c 14 lexer.o

3\_\_\_\_\_\_driver.o\_\_\_\_\_\_\_\_\_ 9 keyword\_table.o 15 lexerDef.h

4\_\_\_grammar.txt\_\_\_\_\_\_\_ 10 parser.h 16 makefile

5\_\_\_interface.h\_\_\_\_\_\_\_ 11 parser.c 17 myprogram

6\_\_\_keyword\_table.c\_\_\_ 12 lexer.c 18 parserDef.h

19 stack.c

20 stack.h

21 stackDef.h

22.stackADT.c

23.stackADT.h

1. Total number of submitted files (including copy the pdf file of this coding details pro forma) : \_\_\_\_\_\_23\_\_\_ (All files should be in ONE folder named as Group\_#)
2. Have you compressed the folder as specified in the submission guidelines? (yes/no)\_\_\_\_yes\_\_\_\_\_\_\_\_
3. **Lexer Details:**
   1. Technique used for pattern matching: \_\_\_Regular expressions or finite state machines.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Keyword Handling Technique: \_Using a hash table or a simple lookup table to identify keywords.
  2. \_\_\_

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

* 1. Hash function description, if used for keyword handling:\_ A basic hash function that maps keywords to indices in a table, possibly using a simple modulo operation to handle collisions.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Have you used twin buffer? (yes/ no) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. Error handling and reporting (yes/No):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. Describe the errors handled by you \_\_\_ Lexical errors such as invalid characters, unrecognized tokens, and end-of-file errors.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Data Structure Description for tokenInfo (in maximum two lines): \_\_A struct containing token type, value, and line/column information.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. **Parser Details:** 
   1. High Level Data Structure Description (in maximum three lines each, avoid giving C definitions used):
      1. grammar : \_\_\_\_\_\_\_\_Context-free grammar defined by a set of productions, where each production specifies a nonterminal and its possible expansions.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* + 1. FIRST and FOLLOW sets Computed using iterative algorithms to determine the possible starting and following terminals for each nonterminal.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* + 1. parse table \_\_ A two-dimensional table mapping nonterminals and terminals to production indices, used for top-down parsing.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* + 1. parse tree: (Describe the node structure also) \_\_\_\_\_A hierarchical structure representing the syntactic structure of the input, with nodes corresponding to nonterminals and terminals.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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* 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)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_inorder traversal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* 1. Grammar and Computation of First and Follow Sets
     1. Data structure for original grammar rules \_\_\_\_\_\_\_\_\_\_\_\_\_Productions stored in an array or linked list.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     2. FIRST and FOLLOW sets computation automated (yes /no)\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     3. Name the functions (if automated) for computation of First and Follow sets\_\_\_\_\_\_computeFirstSets() and computeFollowSets().\_\_\_\_\_\_\_\_\_\_\_\_
     4. If computed First and Follow sets manually and represented in file/function (name that) \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Not applicable.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. Error Handling
     1. Attempted (yes/ no):\_\_\_\_yes\_\_\_\_\_
     2. Describe the types of errors handled \_\_\_\_\_\_all lexical errors get caught,some parsing errors are lost due to tokens being tokenized individually\_\_\_\_Lexical errors are caught during tokenization, while some parsing errors may be lost due to individual token processing.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Compilation Details:
   1. Makefile works (yes/no):\_\_\_yes\_\_\_\_\_
   2. Code Compiles (yes/ no):\_\_\_\_yes\_\_\_\_\_\_\_
   3. Mention the .c files that do not compile:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_NA\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Any specific function that does not compile:\_\_\_\_\_\_\_\_\_NA\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   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):\_\_\_\_\_\_\_\_\_\_\_
3. Execution
   1. status (describe in maximum 2 lines):\_\_\_\_\_\_\_Each of the options is working individually but if you call option 3 after calling option 2,its not responding correctly,so while testing \_\_please test the options individually.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

* 1. Gives segmentation fault with any of the test cases (1-6) uploaded on the course page. If yes, specify the testcase file name:\_\_\_\_\_\_\_No\_\_\_\_\_\_\_

1. Specify the language features your lexer or parser is not able to handle (in maximum one line)\_\_\_\_\_It is handling the cases.\_\_\_\_\_ \_\_\_in the last testcase it is not handling the error in line 29 due to it being tokenized separately other than that it is reporting the other errors\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Are you availing the lifeline (Yes/No): \_\_\_\_\_\_No\_\_\_\_\_\_
3. Declaration: We, SAMRATH SINGH KHANUJA, VIRENDRASINH MANE, VISHNU CHEBOLU, SHASHWAT GOYAL, PARTHIB SARKAR, HARSIMAR SINGH SALUJA declare that we have put our genuine efforts in creating the compiler project code and have submitted the code developed only by us. 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 a disciplinary action as per the institute rules will be taken against all of us in our team and we will accept the penalty as decided by the department of Computer Science and Information Systems, BITS, Pilani.

Your names and IDs

Name: SAMRATH SINGH KHANUJA ID: \_\_\_\_\_\_\_2022A7PS1171P\_\_\_\_\_\_\_\_\_\_\_

Name: VIRENDRASINH MANE \_\_\_\_ID: \_\_\_\_2022A7PS1175P\_\_\_\_\_\_\_\_

Name:\_\_VISHNU CHEBOLU\_\_\_\_\_\_ID: \_\_\_\_\_\_\_\_2022A7PS0124P\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_SHASHWAT GOYAL\_\_\_\_\_\_ID: \_\_\_\_\_\_\_\_2022A7PS0115P\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_PARTHIB SARKAR\_\_\_\_\_\_\_ID: \_\_\_\_\_\_\_\_2022A7PS0111P\_\_\_\_\_\_\_\_\_\_\_

Name: HARSIMAR SINGH SALUJA \_ID: \_\_\_\_\_\_\_2022A7PS1187P\_\_\_\_\_\_\_\_\_\_\_

Date: 15/03/2025

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*Not to exceed 3 pages.*