BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS

Compiler Construction (CS F363)
II Semester 2023-24
Compiler Project
Coding Details
(March 5, 2022)

Group Number
19

1. Team Members Names and IDs
   ID __2021A7PS0685P_____Name_____Bhagwati Iyer_____
   ID ___2021A7PS2218P_____Name_____Rajat Payghan_____
   ID ___2021A7PS0708P_____Name_____Rudra Goyal_____
   ID ___2021A7PS1455P_____Name_____Samraddh Saxena_____
   ID ___2021A7PS2433P_____Name_____Aditya Patel_____
   ID ___2021A7PS0015P_____Name_____Jai Bothra_____
2. Mention the names of the Submitted files :
   driver.c, Dynamic.c, parser.c, grammarBucket.c, grammar.txt, hashmap.c, lexer.c, lexer.h, makefile, parser.h, parseTree.c, stack.c, symboltable.c, text.txt, stage1exe

3. Total number of submitted files (including copy the pdf file of this coding details pro forma) : _____16_____ (All files should be in ONE folder named as Group_#)

4. Have you compressed the folder as specified in the submission guidelines? (yes/no)___**yes**_____

5. **Lexer Details:**
   [A]. Technique used for pattern matching**: Longest match (Maximal Munch).**
   [B]. Keyword Handling Technique: **Lookup in the Symbol Table**
   [C]. Hash function description, if used for keyword handling:
   Jenkins one at a time hashing function. Uses bitwise operation on each char to calculate hash value.
   [D]. Have you used twin buffer? (yes/ no) _____**Yes**_____
   [E]. Error handling and reporting (yes/No):_____**Yes**_____
   [F]. Describe the errors handled by you : **1. Unrecognized Symbols and patterns. 2. Length of TK_FUNID and ID should be in the defined range.**
   [G]. Data Structure Description for tokenInfo (in maximum two lines): **It is a structure called struct lexeme . It contains token name, lexeme name , line number and value if number.**

6. **Parser Details:**

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

i. **grammar :** __It is an array of linked lists where each index corresponds to a grammar rule. Also terminals and non terminals are being stored in hashmaps.
ii. **FIRST and FOLLOW sets :**__First and Follow are being calculated dynamically in dynamic.c . Though they are hard coded in the parser. It is stored in an array of linked lists where every index corresponds to a non terminal being stored in a map in parser.

iii. **parse table:** parse table is a 2D array of list of strings where row number corresponds to mapping of non terminal and column number corresponds to mapping of terminals. Max capacity of a rule is kept at 8.
iv. **parse tree**: (Describe the node structure also) : Data structure of node includes lexeme , Node symbol(for non-terminal), line number, token name, value (if num or real), parent , isLeafnode value, and next and children pointer.

v. **Any other (specify and describe)** __Tree is being created in a file parseTreeOutput.txt in inorder fashion. We are dynamically calculating the first set in a file dynamic.c though it's not integrated with the parser where the first set and follow set are hard-coded.

[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) **Parse tree is being printed in inorder such that first n-1 out of n children then root and then the right child.**

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

i. Data structure for original grammar rules: **Array of Linked list struct List in finalParser.c and struct GRAMMAR in Dynamic.c.**
ii. FIRST and FOLLOW sets computation automated (yes /no): **FIrst- Yes. Follow- partially(not working for some rules).**
iii. Name the functions (if automated) for computation of First and Follow sets: **First- populate_FS and Follow- Populate_FOLLOW in dynamic.c.**
iv. If computed First and Follow sets manually and represented in file/function (name that) _____ _____**finalParser.c**_____.

[D]. Error Handling

v. Attempted (yes/ no):___**yes**____
vi. Describe the types of errors handled: **1. syn used for elements in the follow set of non-terminals and not in the first set. 2. handles problems if lexeme is erroneous. 3. If not a syn terminal then error is handled. 4. Also if terminals don't match then error is handled.**

7. Compilation Details:
   [A]. Makefile works (yes/no):____**Yes**_____
   [B]. Code Compiles (yes/ no):_____**Yes**_____
   [C]. Mention the .c files that do not compile:_____**None**_____
   [D]. Any specific function that does not compile:_____**None**_____
   [E]. Ensured the compatibility of your code with the specified gcc version (yes/no)_____**Yes**_____

8. Driver Details: Does it take care of the options specified earlier(yes/no):_____**Yes**_____
9. Execution
   [A]. status (describe in maximum 2 lines):_____**Lexer and parser working. Remove comments working. Time working.** _____
   _____
   [B]. Gives segmentation fault with any of the test cases (1-6) uploaded on the course page. If yes, specify the test case file name:_____**None**_____

10. Specify the language features your lexer or parser is not able to handle (in maximum one line)_____ _____**None**_____

11. Are you availing the lifeline (Yes/No): _____**No**_____

12. Declaration: We, Rajat Payghan, Rudra Goyal, Samrradh Saxena, Bhagwati Iyer, Aditya Patel and Jay Bothra_ (your names) 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:__Bhagwati Iyer_____ID: ____2021A7PS0685P_____
Name:__Rajat Payghan_____ID: ____2021A7PS2218P_____
Name:__Rudra Goyal_____ID: ____2021A7PS0708P_____
Name:____Samraddh Saxena_____ID: ____2021A7PS1455P_____
Name:____Aditya Patel____ID: _____2021A7PS2433P_____
Name:__Jai Bothra_____ID: _____2021A7PS0015P_____
Date: __05/03/24_____

Not to exceed 3 pages.