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

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION SYSTEMS**

**Principles of Programming Languages (CS F301)**

**Group No.**

**46**

**I Semester 2020-21**

**Assignment-1 Code Submission**

**Coding Details**

**(October 29, 2020)**

1. IDs and Names of team members   
    ID: \_\_\_\_2018A7PS0234P\_\_\_\_\_\_\_\_\_\_ Name: ADIT SAWANT\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID: \_\_\_\_2018A7PS0393P\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_\_\_\_AMEY PATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID: \_\_\_\_2018A7PS0510P\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_\_\_\_DIPANSHI BANSAL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID: \_\_\_\_2018A7PS0345P\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_\_\_\_MAITHIL MEHTA\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Mention the names of the Submitted files :

1\_\_\_grammar.txt\_\_\_\_\_\_\_\_ 7\_\_\_\_\_ t5.txt \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2\_\_\_\_\_driver.c\_\_\_\_\_\_\_ 8\_\_\_\_\_ t6.txt \_\_\_\_\_\_\_\_\_\_

3 t1.txt 9\_\_\_\_\_\_proforma.docx\_\_\_

4 t2.txt \_\_\_\_\_\_\_\_\_\_\_\_\_ 10\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5\_\_\_ t3.txt\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 11\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6\_\_\_ t4.txt \_\_\_\_\_\_\_\_\_\_\_\_\_ 12\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Total number of submitted files: \_\_\_\_9\_\_\_\_\_\_ (All files should be in **ONE folder** named exactly as Group\_#, # is your group number)
2. 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]
3. Have you compressed the folder as specified in the submission guidelines? (yes/no) \_\_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_
4. Have you ensured that the folder does not have any \*.o file or any executable file? (yes/no) \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_
5. **Grammar and token stream**

Total number of production rules: \_\_\_\_59\_\_\_\_\_\_\_\_\_\_\_\_\_

Total number of non-terminals: \_\_\_\_\_35\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Total number of terminals: \_\_\_\_\_\_\_\_32\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Grammar.txt file created [yes/no]: \_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_

Nonterminal symbols enumerated [yes/no]: \_\_\_NO\_\_\_\_\_\_\_\_\_\_\_

Terminal symbols enumerated [yes/no]: \_\_\_\_\_NO\_\_\_\_\_\_\_\_\_\_\_\_\_

Grammar data structure populated successfully [yes/no]: \_\_\_\_YES\_\_\_\_\_\_\_\_\_\_

Tokenstream created [yes/no]: \_\_\_\_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Which functions have you implemented?**
   1. ***readGrammar () [yes/no] \_\_\_\_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
   2. ***tokeniseSourcecode () [yes/no] \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
   3. ***createParseTree () [yes/no] \_\_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
   4. ***traverseParseTree () [yes/no] \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
   5. ***printParseTree () [yes/no] \_\_\_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
   6. ***printTypeExpressionTable () [yes/no] \_\_\_\_\_YES\_\_\_\_\_\_\_\_\_***
2. **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)

We have used Pre-Order Traversal via recursion for printing node of Parse Tree. We have implemented the n-ary tree such that each tree node has 1 sibling and 1 child pointer.

1. **Type Expression Table**

[A]. Constructed (yes/no): \_\_YES\_\_\_\_\_

[B]. Implemented as (lookup table/ hash table): \_\_\_LOOKUP TABLE\_\_\_\_\_\_\_\_\_\_\_\_

[C]. Printing as per the given format (yes/no): \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[C]. Describe the structure of the type expression accommodating all types (in maximum two lines)

These are the fields for our Type Expression: -  
1. A character array for the name of the variable  
2. An enumeration for the datatype of the variable with fields as Primitive Datatype, Rectangular Array and Jagged Array  
3. An enumeration for the nature of the variable with fields as Static, Dynamic, Not Applicable, which will be NA in all cases except Rectangular Array.  
4. A union with three fields – a character array for Primitive Type and two structures namely Jagged Array and Rectangular Array

1. **Compilation Details:**
   1. Implemented in multiple files / single file: \_\_\_\_\_\_\_SINGLE FILE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Makefile works (yes/no): \_\_\_--\_\_\_\_\_\_\_\_
   3. Code Compiles (yes/ no): \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_
   4. Mention the .c files that do not compile: \_\_\_\_\_\_\_NONE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Any specific function that does not compile: \_\_\_\_NONE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Ensured the compatibility of your code with the specified gcc version(yes/no) \_\_YES\_\_\_\_\_\_\_\_\_
   7. Give below the exact commands to compile your code :
      * 1. Execute **gcc driver.c** in the terminal
        2. Execute **./a.out <filename>** in the terminal

For example, if we want to run test case t6.txt then type ./a.out t6.txt

1. **Driver Details**: Does it take care of the options specified earlier(yes/no): \_\_\_YES\_\_\_\_\_\_\_\_
2. **Execution** 
   1. Status (describe in maximum 2 lines): No compilation errors or runtime errors encountered on given test cases
   2. Gives segmentation fault with any of the test cases (1-6) uploaded on the course page. If yes, specify the testcase file name: \_\_\_NONE\_\_\_\_\_\_\_\_\_\_
   3. Command line arguments used for input file (yes/no): \_\_\_YES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Specify the language features your code is not able to handle (in maximum one line) \_\_\_\_Arithmetic operation between integer and array type detected as type error. Otherwise all errors are handled perfectly.\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Are you availing the lifeline? (Yes/No): \_\_YES\_\_\_\_\_\_\_\_\_\_\_
5. Declaration: We, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Adit Sawant, Amey Pate, Dipanshi Bansal, Maithil Mehta\_\_\_\_\_\_\_\_\_\_\_\_\_ (your names) declare that we have put our genuine efforts in creating the 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 a 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 names below]

ID\_\_\_\_\_\_2018A7PS0234P\_\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_Adit Sawant\_\_\_\_\_\_\_\_\_\_\_

ID\_\_\_\_\_\_2018A7PS0393P\_\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_Amey Pate\_\_\_\_\_\_\_\_\_\_\_\_

ID\_\_\_\_\_\_2018A7PS0510P\_\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_Dipanshi Bansal\_\_\_\_\_\_\_\_

ID\_\_\_\_\_\_2018A7PS0345P\_\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_Maithil Mehta\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_30.10.2020\_\_\_\_\_\_\_\_\_\_\_\_\_

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Should not exceed 3 pages.