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

Group No.

15

Compiler Construction (CS F363)
II Semester 2018-19
Compiler Project (Stage-2 Submission)
Coding Details
(April 14, 2019)

Instruction: Write the details precisely and neatly. Places where you do not have anything to mention, please write NA for Not Applicable.

1. IDs and Names of team members

   ID:___2016A7PS0024P___Name:___AMAN SANGHI__

   ID:___2016A7PS0072P___Name:___SANCHIT SHRIVASTAVA__

   ID:___2016A7PS0135P___Name:___SARTHAK AGARWAL__

   ID:___2016A7PS0339P___Name:___ALEX MATHAI__

2. Mention the names of the Submitted files (Include Stage-1 and Stage-2 both)

1_lexerDef.h_	9_symbolTable.h_	17__
2_parserDef.h_	10_codegen.c_	18
3_astDef.h_	11_codegen.h_	19 _____
4_symbolTableDef.h_	12_lexer.c_	20_____
5_lexer.h_	13_parser.c_	21_____
6_parser.h_	14_ast.c_	22_____
7_ast.h_	15_symbolTable.c_	23_____
8_grammar.txt_	16_driver.c_	24_____

3. Total number of submitted files: __19____(All files should be in ONE folder named exactly as Group_#, # is your group number)
4. Have you compressed the folder as specified in the submission guidelines? (yes/no) _yes__

5. Status of Code development: Mention 'Yes' if you have developed the code for the given module, else mention 'No'.
   a. Lexer (Yes/No): _Yes_
   b. Parser (Yes/No):_Yes_
   c. Abstract Syntax tree (Yes/No):_Yes_
   d. Symbol Table (Yes/ No):_Yes_
   e. Type checking Module (Yes/No):_Yes_
   f. Semantic Analysis Module (Yes/ no):_Yes_(reached LEVEL ____ as per the details uploaded)
   g. Code Generator (Yes/No):_Yes_
6. Execution Status:
   a. Code generator produces code.asm (Yes/ No):_Yes_
   b. code.asm produces correct output using NASM for testcases (Main#.txt, #:1-4): _Yes_
   c. Semantic Analyzer produces semantic errors appropriately (Yes/No):_Yes_
   d. Type Checker reports type mismatch errors appropriately (Yes/ No):_Yes_
   e. Symbol Table is constructed (yes/no)_Yes_and printed appropriately (Yes /No):_Yes_
   f. AST is constructed (yes/ no) _Yes_and printed (yes/no) _Yes_
   g. Name the test cases out of 7 as uploaded on the course website for which you get the segmentation fault (testcase#.txt ; # 1-3 and Main@.txt ; @:1-4):__NA__

7. Data Structures (Describe in maximum 2 lines and avoid giving C definition of it)

a. AST node structure___contains pointers to children,siblings,parent and concat _ __has labeltype attribute (to understand rule numbers), lexical token , line number__ ____

b. Symbol Table structure:___hashtable for variables ,linked list to maintain order, ___ __size and offsets, slots → filled with number in hashtable __

c. Data structure for global variables: ___same as symbol table___
d. Record type expression structure:___same as symbol table___
e. Input parameters type structure:___linked list of nodes stored in function structure__
f. Output parameters type structure:___linked list of nodes_____
g. Structure for maintaining the three address code(if created) :___NA___
h. Any other interesting data structure used: __ function_st : ___structure for function-→ int position, input _param linked list output_param linked list , hashtable of variables for the function__

_____

8. Semantic Checks: Mention your scheme NEATLY for testing the following major checks
   a. Variable not Declared :A hashtable of variable is maintained and when ever a variable is accessed it is first checked in hashtable and if it is not found it is and error
   b. Multiple declarations: whenever a declaration of variable come we search it in a hashtable it it exist the it and error otherwise it is added to hashtable
   c. Number and type of input and output parameters:While creating a list of input and output parameters a count variable is maintained and for each addition it is incremented by one
   d. assignment of value to the output parameter in a function
   e. function call semantics:There is hash table for functions as well so whenever a function is called it is checked in the hashtable whether it exists or not
   f. type checking In the hashtable of the variable corresponding to every variable there type is also saved so whenever a variable is accessed the type is checked from the hashtable
   g. return semantics:We have kept a list of output parameter for every function this list consists of name of the parameter and corresponding types and similarly there is a list for return statement and it is matched with the output parameter list for having same number of element and have same type in order
   h. Recursion :Every function has a unique id and whenever a function is called within a function there ids are checked and if they are equal it is reported as error
   i. function overloading: since there is a hashtable of function we check whether a function with the same name exist it is reported as error
   j. 'while' loop semantics :inside the boolean expression whichever variables are used are put into a hashtable and then every variable that is inside the while which is changing is compared against the hashtable variables and if none of them are present in the hashtable it is reported as error

      _____

   k. record data type semantics and type checking of record type variables : records are also stored in the hashtable and corresponding to each record type there is another hashtable which stores the definition of the record type
   l. register allocation:_____
   m. Scope of variables and their visibility :_corresponding to each function there is a hashtable which keeps whick varialble are visible inside it and there is hashtable for global variables and they are visible everywhere _____
9. Compilation Details:
   a. Makefile works (yes/No):__Yes__
   b. Code Compiles (Yes/ No):__Yes__
   c. Mention the .c files that do not compile:____NA_____
   d. Any specific function that does not compile:____NA_____

e. Ensured the compatibility of your code with the specified gcc version(yes/no)_____

10. Driver Details: Does it take care of the options specified earlier?(yes/no):___yes_____
11. Specify the language features your compiler is not able to handle (in maximum one line)
    _____None_____
12. Are you availing the lifeline (Yes/No): ___Yes_____
13. Write exact command you expect to be used for executing the code.asm using NASM simulator
    _____nasm -f elf output.asm -o output.o_____
    _____ld -m elf_i386 -o output output.o_____
    _____./output_____-
14. Strength of your code(Tick the boxes where applicable): (a) correctness • (b) completeness • (c) robust • (d) Well documented • (e) readable • (f) strong data structure • (f) Good programming style (indentation, avoidance of goto stmts etc) • (g) modular • (h)space and time efficient• a,b,c,d,e,f,g,h
15. Any other point you wish to mention:
    _____None_____

    _____

    _____
16. Declaration: We, ___aman sanghi , sanchit shrivastava , sarthak agarwal
    _____ and
    _____alex mathai_____ (your names) declare that we have put our genuine efforts in creating the compiler project code and have submitted the code developed 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 us and we will accept the penalty as decided by the department of Computer Science and Information Systems, BITS, Pilani.

    Date:___15-04-2019_____
    (Not to exceed beyond 3 pages)