COMSATS University Islamabad, Wah Campus

Lab Assignment 3

Department of: COMPUTER SCIENCE

Class/Program: BS(7-A,C,D) **Due Date:** 7 December 2022 16:00

Subject: Compiler Construction **Instructor:** Muhammad Nadeem

Note: copying will lead to ZERO
You need to hard code parsing table, you can generate tokens using PLY module or can implement your customized NFA/DFA.
Only python source file

Only a single source file (python file) should be submitted. Do not ZIP it.

Time line will not be extended, so must submit in time.

Q4. Consider following SDD.

Write SLR-1 parser for following grammar.

PRODUCTION	SEMANTIC RULES
$S \rightarrow id := E$	$S.code := E.code \mid\mid gen(id.place\ ':='\ E.place)$
$E \rightarrow E_1 + E_2$	$E.place := newtemp;$ $E.code := E_1.code \mid\mid E_2.code \mid\mid gen(E.place\ ':='\ E_1.place\ '+'\ E_2.place)$
$E \rightarrow E_1 * E_2$	$E.place := newtemp;$ $E.code := E_1.code \mid\mid E_2.code \mid\mid gen(E.place\ ':='\ E_1.place\ '*'\ E_2.place)$
$E \rightarrow - E_1$	$E.place := newtemp;$ $E.code := E_1.code \mid\mid gen(E.place\ ':='\ 'uminus'\ E_1.place)$
$E \rightarrow (E_1)$	$E.place := E_1.place;$ $E.code := E_1.code$
$E \rightarrow id$	$E.place := id.place;$ $E.code := ''$

Here **gen()** function is **print** function. And newtemp, is a special instruction which generate a new temporary variable.

e.g E.place = newtemp, will create a temp variable (t1) and assign it to E.place attribute. Suppose E.place=newtemp again called, so it will generate a new temp variable (t2), and assign it ti E.place attribute.

Whenever gen() function is called , you need to print contents of gen on blank space. For example consider
E.place = t1 , E1.place = a and E2.place = t2 then
gen(E.place ‘:=’ E1.place ‘*’ E2.place) will generate following output.
T1 := a * t2

You are required to draw parse tree and annotated parse tree for following inputs. (also print messages, when gen function is called)

a. a:=b + f + g
b. g:= (a + b + (c + d * f))
c. h:= -b * g + j

You are encouraged to learn from online resources and books. In case of any ambiguity , feel free to contact me.

Best of Luck