



COMSATS University Islamabad, Wah Campus

Department of: COMPUTER
SCIENCE

Class/Program: BS(C-E) Due Date: 23 June 2022 10:30
Subject: Compiler Construction (Lab) Instructor: Muhammad Nadeem

**Note: copying will lead to ZERO
Marks will be given on effort base.**

C++ has many type of tokens, including operators, precedence and associativity. Following are few well known operators and associativity.

- :: scope resolution
- [] array subscript
- ++ postfix increment
- postfix decrement
- ~ one's complement
- ! logical NOT
- * Multiplication operators
- < Less then
- > greater then
- <= less then or equal to
- >= greater then are equal to
- != not equal to
- >>= Right shift Assignment
- ^= Bitwise XOR Assignment

Consider the following SDT

```
E' -> E          {print("At last Accepted")}
E -> E + T        {print("T is reduced ")}
E -> T            {print(" E+T is reduced")}
T -> T * F        {print(" F is reduced")}
T -> F            {print(" T*F is reduced")}
F -> ( E )        {print(" (E) is reduced")}
F -> id           {print(id.val , " is reduced")}
```

where id hold the properties of a identifier (a token which can start with _ or samll [a-z] and then there can be the repetition of [a-z] [A-Z] [0-9] and _).

following is the SLR-1 parsing table for above SDT.

LR table										
State	ACTION						GOTO			
	+	*	()	id	\$	E'	E	T	F
0			s4		s5			1	2	3
1	s6					acc				
2	r ₂	s7		r ₂		r ₂				
3	r ₄	r ₄		r ₄		r ₄				
4			s4		s5			8	2	3
5	r ₆	r ₆		r ₆		r ₆				
6			s4		s5				9	3
7			s4		s5					10
8	s6			s11						
9	r ₁	s7		r ₁		r ₁				
10	r ₃	r ₃		r ₃		r ₃				
11	r ₅	r ₅		r ₅		r ₅				

You are required to implement following tasks.

1. Hard code this table in source program. (no need to read from file).
2. Hard code NFA for identifier.
3. Hard code input in the program.
4. Identify all type of token mentioned at start of program and identifier token too.
5. Print all identified tokens and only save tokens which are used in SDT.
6. Parse SDT using SLR-1 grammar.

You are required to upload only .py file, DO NOT Zip your file.

1. You need to submit code on portal with in due time.

2. Any code copied online or from fellow will be marked zero. That means you will get F grade in subject if you do not follow instructions.