CPSC 323 Compilers & Languages (Fall 2023)

PROJECT 2

Deadline: November 29th, 2023

Project 2 deals with the analysis and implementation of a Parser (Syntax Analyzer). This project must be submitted/uploaded online on Canvas.

You are allowed to write your project code in C/C++/Java/Python etc. but you ARE NOT allowed to use Yacc, Bison, or any other items similar that assist in the creation of compilers.

- Given the following CFG and the LR parsing table, write a program to trace input strings over { id, +, *,), (} and ending with $.
- Test it on three input strings (1) (id+id)*id$ (2) id*id$ (3) (id*)$
- Show the content of the stack implementation for each case. Output must be displayed along the stack implementation.
  Output (Example):
  Input: (id+id)$
  Stack:

Step	Stack	Input	Action
… …	… …	… …	… …

  Output: String is accepted/ String is not accepted.

- Draw the Parse Tree for each case. Save this information in a document named “tree_mydesign”.

CFG	FIRST	FOLLOW
E→E + T E → T T→ T * F T→ F F→ (E) F→ id	FIRST(E) = { (, id } FIRST(T) = { (, id } FIRST(F) = { (, id }	FOLLOW(E) = { + ,) , $ } FOLLOW(T) = { + , * ,) , $ } FOLLOW(F) = { + , * ,) , $ }

LR Parsing Table

State	**id**	**+**	*****	**(**	**)**	**$**	**E**	**T**	**F**
0	S5			S4			1	2	3
1		S6				**acc**			
2		R2	S7		R2	R2			
3		R4	R4		R4	R4			
4	S5			S4			8	2	3
5		R6	R6		R6	R6			
6	S5			S4				9	3
7	S5			S4					10
8		S6			S11				
9		R1	S7		R1	R1			
10		R3	R3		R3	R3			
11		R5	R5		R5	R5			

- You must write a report file to briefly specify documentation & how to setup/run your program if needed. Document the code, processes, roles, and results in this file.
- Your executable program, which is supposed to be developed in C/C++/Java/Python, should represent the implementation of your idea.
- Your submission must have Three (3) files: your design file, your program file, and a documentation file. The Design file and Documentation file should be submitted in PDF format. Upload it in canvas (either the zip file or GitHub link).
- Remember, the journey is as important as the destination. All the best!