# COMPILER CONSTRUCTION

**A picture containing graphical user interface

Description automatically generated**

**ASSIGNMENT: 01**

|  |  |
| --- | --- |
| **Name** | M. ZAIN PARACHA |
| **Registration Number** | 200901076 |
| **Batch & Section** | CS (01)-A |
| **Assignment** | COMPILER CONSTRUCTION |
| **Submitted to** | MA’AM TAYYABA ARSHAD |
| **Date** | 14TH OCT, 2022 |

**Q:** Let Context- free syntax is specified with a grammar G= (S, N, T, P),

Where:

·S is the start symbol

·N is a set of non-terminal symbols

·T is set of terminal symbols or words

·P is a set of productions or rewrite rules

Consider the following Context-Free Grammar

1. S →S + T

2. S → T

3. T → F

4. T → T ∗ F

5. F → E

6. F → (S)

7. E → a

8. E →b

For the above CFG, S = Start Symbol T = {a, b} N = {T, E, F} P = {1, 2, 3, 4,5,6,7,8}

1. Derive the expression (a + b) \*a + b using different productions.

**ANSWER:**

Id1= (id2+id3)\*id4+id5

|  |  |
| --- | --- |
| **Production** | **Result** |
| S ID=E; | ID=E; |
| E E+T/T; | E+T/T; |
| T T\*T2/T2 | T\*T2/T2 |
| T2 T2+F/F | T2+F/F |
| F ( E)/id/ a/ b | ( E)/id/ a/ b |

2. Construct a parse tree for expression (a +b) \*a + b.

**ANSWER:**

s

E

;

id

=

T2

F

+

F

id

T2

T2

\*

T

F

T2

T

+

T

E

F b

­­

(E)

a

**CONCLUSION:**

In this assignment we have learned about the production rules and parse tree and also revised the basic concepts of automata. We also know how to prove the production rules by using parse tree.

**END**