

# Theory of Computation

## Assignment-2

### Group Member Details

Shashank Pratap Singh	2019B4A70956H
Shlok Mongia	2019B2A71527H
Sahil Punjabi	2019B5A71379H
Soutik Mohinta	2019B5A71392H

### Grammar

Variables : {S, D, F, R, W, M, E, B, A, C, V, L, N}

S is the starting variable

D is the declaration sentence

F is the rest of the program

R is the read statement

W is the write statement

M is the assignment statement

E is the expression statement, handling == and >

B is the expression statement handling + and -

A is the expression statement handling \* and /

C is the expression statement handling variables, constants and (,.)

L is the for loop statement

V is the statement that derives variables

N is the statement that derives constants

Terminals : {int , ; , read , write , for , ( , ) , , , { , } , + , - , = , == , \* , / , > , {a-z}<sup>+</sup> , {0-9}<sup>+</sup> , ε}

Starting Variable : S

Productions: -

$S \rightarrow \text{int } D; F$

$$F \rightarrow R; F \mid W; F \mid M; F \mid L; F \mid \epsilon$$
$$D \rightarrow V \mid V, D$$
$$R \rightarrow \textit{read } V$$
$$W \rightarrow \textit{write } V \mid \textit{write } N$$
$$M \rightarrow V = E$$
$$E \rightarrow E == B \mid E > B \mid B$$
$$B \rightarrow B + A \mid B - A \mid A$$
$$A \rightarrow A/C \mid A * C \mid C$$
$$C \rightarrow (E) \mid V \mid N$$
$$V \rightarrow \{a - z\}^+$$
$$L \rightarrow \textit{for}(M; E; M)\{F\}$$
$$N \rightarrow \{0 - 9\}^+$$