NORTH SOUTH UNIVERSITY

Department of Electrical and Computer Engineering

Assignment – 03

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Course No.	: CSE 273
Course Title	: Introduction to Theory of Computation
Section	: 3
Date	: 09 April 2025

CFG Construction - 5x

1|

Define the CFG for identifier used in C programming Language, that start with letter not digit.

⇒

$I \longrightarrow LR$

$R \longrightarrow LR \mid DR \mid \in$

$L \longrightarrow a \mid b \mid c \mid \cdots \mid y \mid z \mid A \mid B \mid \cdots \mid Y \mid Z$

$D \longrightarrow 0 \mid 1 \mid 2 \mid 3 \mid \cdots \mid 8 \mid 9$

2|

Binary string, where number of zeros is the multiplier of 3 and followed by odd numbers of one's.

$\Sigma = \{0, 1\}$

Rule:

$|0| = 3n \; ; \; n \geq 1$

$|1| = 2n+1 \; ; \; n \geq 0$

⇒

$S \longrightarrow ZN$

$Z \longrightarrow 000 \mid 000Z$

$N \longrightarrow 1 \mid 1D$

$D \longrightarrow 01 \mid 11D$

P.NO.

3|

CFG for floating point number, follows the given restriction

i. start with '+' or '-' (for '+' sign may not exist)

ii. must be at least one digit before or after the decimal point.

iii. decimal point is optional

⇒

$S \longrightarrow AN \mid A.N \mid AN.N$

$A \longrightarrow + \mid - \mid \in$

$N \longrightarrow DR$

$R \longrightarrow DR \mid \in$

$D \longrightarrow 0 \mid 1 \mid 2 \mid \cdots \mid 8 \mid 9$

4|

CFG for valid time string - 12 hour formate,

HH : MM : SS ~~AM/PM~~ am/pm

⇒

$Z \longrightarrow H:M:S \; x$

$H \longrightarrow AD \mid 2B$

$A \longrightarrow 0 \mid 1$

$B \longrightarrow 0 \mid 1 \mid 2 \mid 3$

$M \longrightarrow CD$

$C \longrightarrow 0 \mid 1 \mid 2 \mid 3 \mid 4 \mid 5$

$S \longrightarrow CD$

$x \longrightarrow AM \mid PM$

⇒

S → AB : CD : CD X

A → 0 | 1

B → 0 | 1 | 2

C → 0 | 1 | 2 | 3 | 4 | 5

D → 0 | 1 | 2 | ... | 8 | 9

X → am | pm

5|

Decimal string, in which odd indexed elements are definitely even digit, even indexed elements can be anything. Index start with 0.

⇒

S → D | DN

N → E | E D N | ∈

E → 0 | 2 | 4 | 6 | 8

D → 0 | 1 | 2 | ... | 8 | 9