CT-1 Question 3(i)

#Tokenization of the sample code :

<NumType, %d> <keyword, main> <Bracket, (> <Bracket,)>
<Bracket, {>

<NumType, %d> <Id, 1> <Operator, => <Number, 127>
<Semicolon>

<NumType, %d> <Id, Semicolon>

<keyword, printf> <Bracket, (> <Literal, 1000>
<Bracket,)> <Semicolon>

<keyword, if> <Bracket, (> <Id, 1> <Operator, <>
<Number, 0.0> <Bracket,)>
<Bracket, {>

<keyword, printf> <Bracket, (> <Literal, 1001>
<Bracket,)> <Semicolon>

<Bracket, }>

<keyword, else>
<Bracket, {>

<keyword, printf> <Bracket, (> <Literal, 1002>
<Bracket,)> <Semicolon>

<Bracket, }>

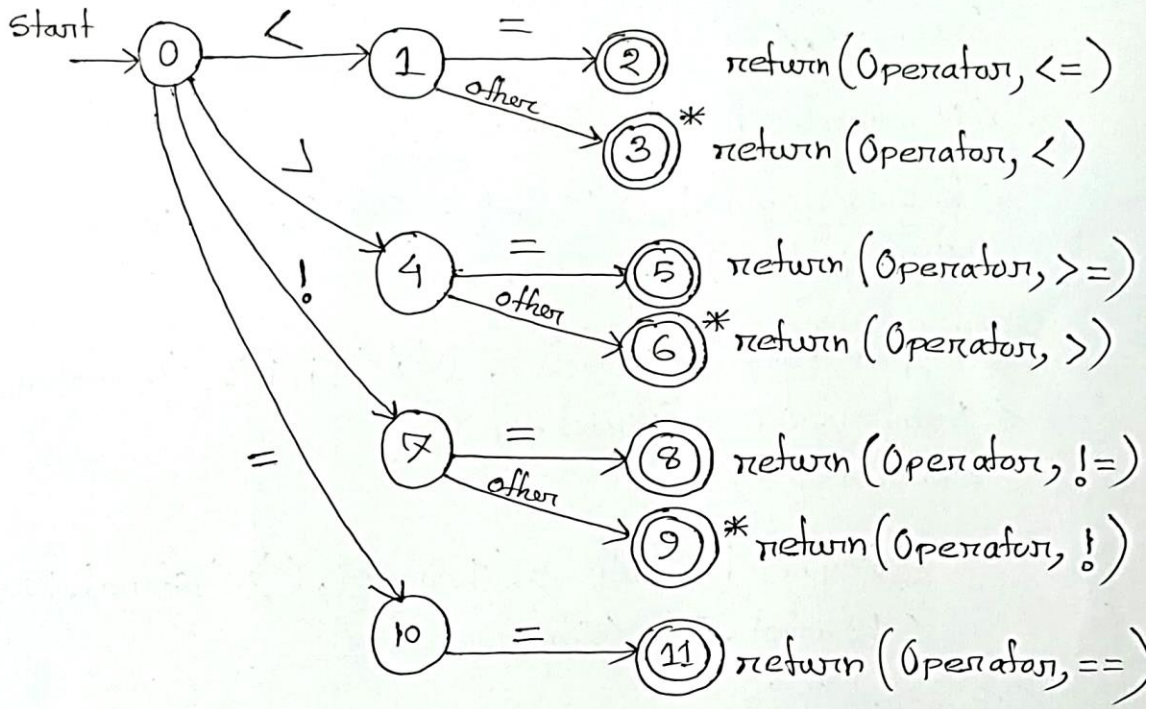
<Number, 0> <Semicolon>

<Bracket, }>

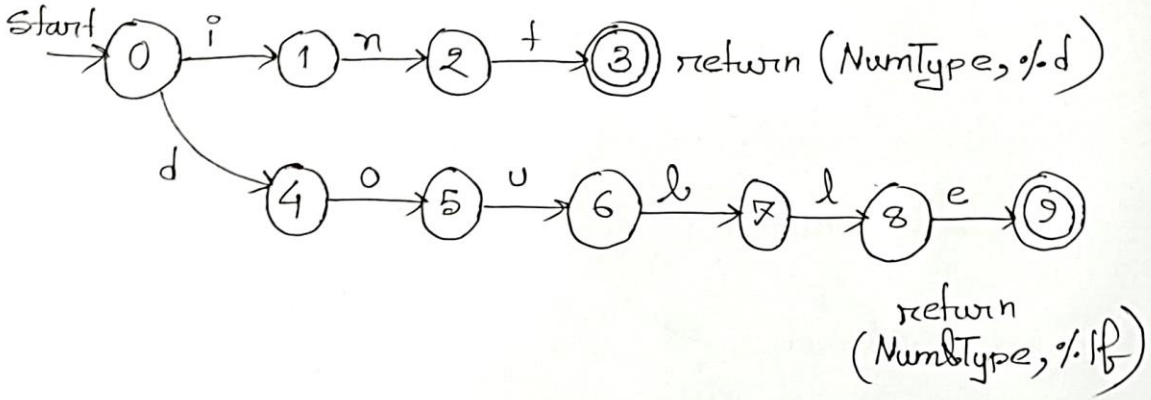
CT-01 Question 3(ii)

#Number ~~NumType~~ : (Same as the transition diagram of number given in your slide)

#Operator :



NumType :


Start
0
i
1
n
2
t
3
return (NumType, %d)
d
4
o
5
u
6
l
7
l
8
e
9
return
(NumType, %lf)

Mid-term Question 01

$S \rightarrow ABC$
$A \rightarrow a \mid Cb \mid \epsilon$
$B \rightarrow c \mid dA \mid \epsilon$
$C \rightarrow e \mid f$

FIRST Sets :

$FIRST(S) = \{FIRST(A)\} = \{a, e, f, \epsilon\}$
$= \{a, e, f, FIRST(B)\}$
$= \{a, e, f, c, d, \epsilon\}$
$= \{a, e, f, c, d, FIRST(C)\}$
$= \{a, e, f, c, d\}$

$FIRST(A) = \{a, FIRST(c), \epsilon\} = \{a, e, f, \epsilon\}$
$FIRST(B) = \{c, d, \epsilon\}$
$FIRST(C) = \{e, f\}$

FOLLOW SETS :

	①	②	③	③
FOLLOW(S)	{$}	{$}	{$}	{$}
FOLLOW(A)		{c, d, e, f}	{c, d, e, f}	{c, d, e, f}
FOLLOW(B)		{e, f}	{e, f}	{e, f}
FOLLOW(C)		{b}	{$, b}	{b, $}

① → Rule 1 , ② → Rule 2 ($A \rightarrow \alpha B \beta$) , ③ → Rule 3 ($A \rightarrow \alpha B$)

$S \rightarrow \underline{ABC}$
$\alpha B \beta$

∴ When $B = A$, $\beta = BC$, ∴ $FOLLOW(A) = FIRST(BC)$
$= \{c, d, e, f\}$

Left Factoring

Mid-term Ques-02

* $A \rightarrow abAB \mid abcBc \mid abcA$
  $B \rightarrow b \mid d \mid \epsilon$

Soln : $A \rightarrow \underline{ab}AB \mid \underline{ab}cBc \mid \underline{ab}cA$

$A \rightarrow abA'$
$A' \rightarrow AB \mid \underline{c}Bc \mid \underline{c}A$

$A' \rightarrow AB \mid cA''$
$A'' \rightarrow Bc \mid A$

∴ Finally, $A \rightarrow abA'$
$A' \rightarrow AB \mid cA''$
$A'' \rightarrow Bc \mid A$
$B \rightarrow b \mid d \mid \epsilon$