

# CD: UNIT-3

## Syntax-Directed Translation

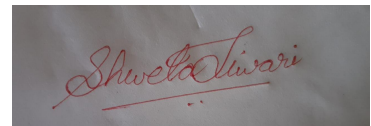
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(CD)

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### TOPIC On : UNIT-3

## 3 Address Code for (IF then ELSE, BOOLEAN, WHILE and For LOOP)

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Under On: Syntax-Directed Translation

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3- Address code for [if then else, boolean, while and for loop].

① 3 address code for if - then - else

If  $a < b$  then  $x = y + z$  else  $p = q + r$ .

1. If  $a < b$  goto (3) True
2. goto (6) false
3.  $t_1 = y + z$
4.  $x = t_1$
5. goto - -
6.  $t_2 = q + r$
7.  $p = t_2$
8. goto

② 3-address code for while loop

while ( $a < b$ ) to  $x = y + z$

1. if ( $a < b$ ) goto (3) (true)
2. goto -- (false)
3.  $t_1 = y + z$
4.  $x = t_1$
5. goto (4)

③ 3-address code for for loop

for ( $i = 1; i \leq 20; i++$ )

$x = y + z$

1.  $i = 1$
2. if  $i \leq 20$  goto -- (true)
3. goto -- (false)
4.  $t_1 = i + 1$
5.  $i = t_1$

6. goto (2)

7.  $t_2 = y + z$

8.  $x = t_2$

9. goto (4)

④ 3-address code for Boolean Expression

If  $a < b$  AND  $c < d$  Then  $p = q + r$

1. If  $a < b$  goto (3) true

2. goto -- false

3. If  $c < d$  goto (5) true

4. goto -- false

5.  $t_1 = q + r$

6.  $p = t_1$

7. goto --



Ques - while ( $A < C$  and  $B > D$ ) do

if  $A = 1$  then  $C = C + 1$

else  
while  $A \leq D$  do  
 $A = A + 3$

Answer -

1. if  $A < C$  goto (3) true
2. ~~goto~~ ~~goto~~ ~~goto~~ ~~goto~~ false
3. if  $B > D$  goto (5) true
4. goto -- false
5. if  $A = 1$  goto (7) true
6. goto (10) false
7. ~~goto~~  $t_1 = C + 1$
8.  $C = t_1$
9. goto (1) -
10. if  $A \leq D$  goto (2) true

11. goto(1) false
12.  $t_2 = A + 3$
13.  $A = t_2$
14. goto(10) ~~false~~ true
15. goto(1) false

## ② Switch: -

switch (i+j)

{ case 1:  $x = y + z$   
 case 2:  $u = v + w$   
~~case 3:  $p = q + r$~~   
 default:  $p = q + r$

1.  $t_1 = i + j$
2. If  $t_1 = 1$  goto(5)
3. If  $t_1 = 2$  goto(8)
4. goto(11)
5.  $t_2 = y + z$
6.  $x = t_2$
7. goto --

8.  $t_3 = u + w$

9.  $u = t_3$

10. goto --

11.  $t_4 = q + r$

12.  $p = t_4$

13. goto --

Shweta