United College of Engineering and Research, Naini

Computer Science and Engineering Department

Unit 3

Compiler Design

Synatx Directed Translation

Prepared By

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SDT rule for Control Statements

S → if E then S1

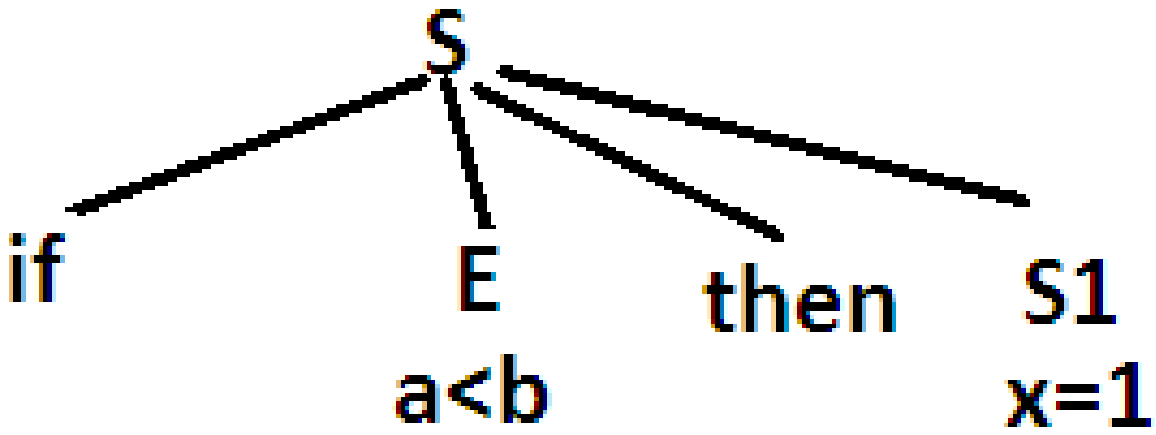
S → if E then S1 else S2

S → while E do S1

Write the 3AC for the expression

```
if(a>b)
{
        x=1;
}
```

1. if(a>b) goto (3)
2. goto(4)
3. x=1
4. exit

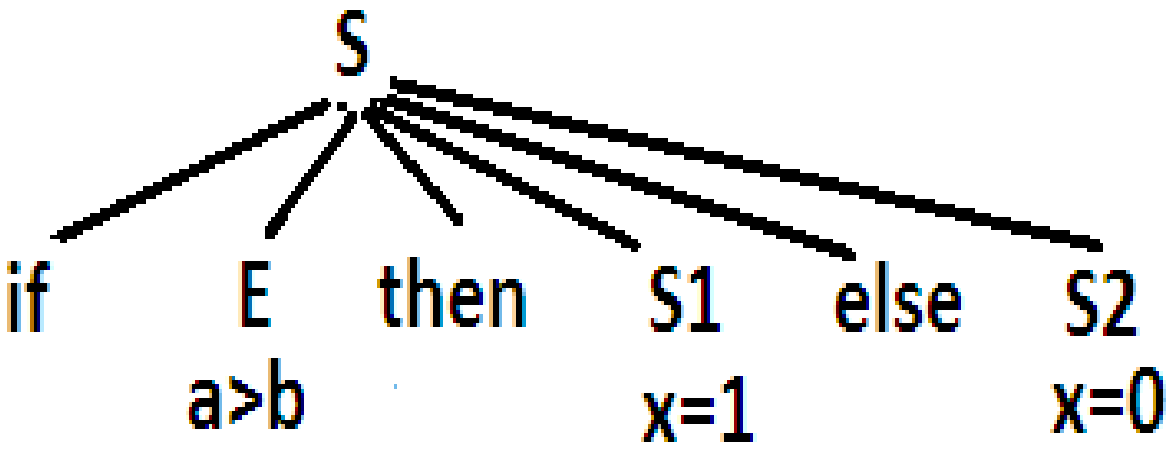

S
if
E
a<b
then
S1
x=1

$S \rightarrow$ **if** E **then** S_1	$E.true := newlabel;$ $E.false := S.next;$ $S_1.next := S.next;$ $S.code := E.code \mid\mid gen(E.true\ ':') \mid\mid S_1.code$

Write the 3AC for the expression

```
if(a>b)
        x=1;
else
        x=0;
```

1. if(a>b) goto (4)
2. x=0
3. goto(5)
4. x=1
5. exit

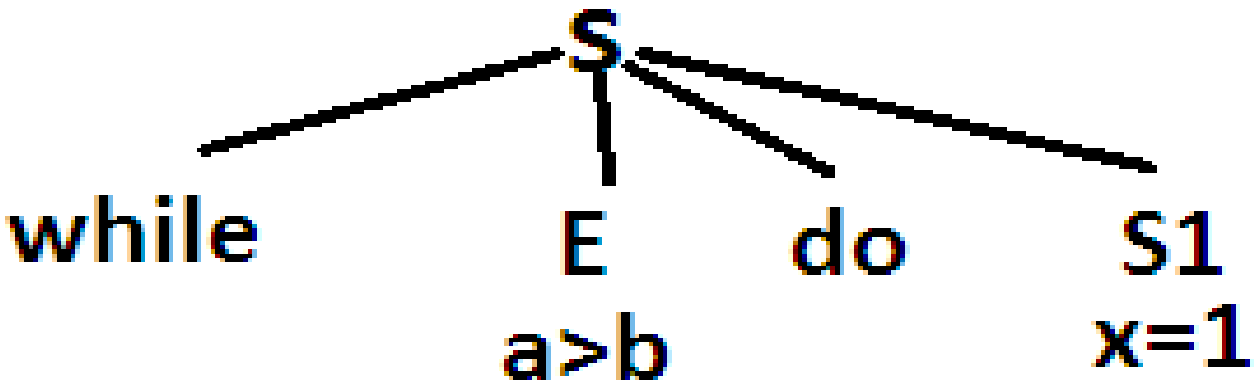

S
if
E
a>b
then
S1
x=1
else
S2
x=0

$S \rightarrow$ **if** E **then** S_1 **else** S_2	$E.true := newlabel;$ $E.false := newlabel;$ $S_1.next := S.next;$ $S_2.next := S.next;$ $S.code := E.code \mid\mid gen(E.true\ ':') \mid\mid S_1.code \mid\mid$ $gen(\text{'}\mathbf{goto}\text{'}\ S.next) \mid\mid$ $gen(E.false\ ':') \mid\mid S_2.code$

Write the 3AC for the expression

while(a>b)
x=1

1. if a>b goto(3)
2. goto(4)
3. x=1
4. exit


S
while
E
do
S1
a>b
x=1

$S \rightarrow$ **while** E **do** S_1	*S.begin : = newlabel;* *E.true : = newlabel;* *E.false : = S.next;* S_1*.next : = S.begin;* *S.code : = gen(S.begin ':')|| E.code ||* *gen(E.true ':') ||* S_1*.code ||* *gen('***goto***' S.begin)*