تمرین کامپایلر پیشرفته - نیمسال اول ۹۶-۹۵ - محسن امیریان
۹۵۷۲۲۳۰۳۴

<u>تمرین ۱</u>: برای جملات if در زبان C را بنویسید و همراه با عمل ولیدکد، آزمون نوع هم انجام دهد.

```
1)  <IfST> -> if ( <Condition> )      { LElse = NewLabel;
                                         Emitline ( 'if Not' + Conditionval +
                                                'goto' + Lthen );
                                        if isTemp(Conditioval) then
                                                RemoveTemp;
                                        IfSTType = ConditionType
                                        if ( ConditionType != boolean ) then
                                                Type Error;
                                      }

             { <ST> }                 { Lend = NewLabel;
                                        Emitline ( 'goto' + Lend );
                                        Emitline ( LElse + ':' );
                                      }

             <Else Part>              { Emitline ( Lend + ':' ); }

2)  <ElsePart> -> else <ST>
                | λ
```

3) <Condition> → <Condition¹> AND <B>

```
{ if isTemp(Condition¹val) then
  Begin
    Conditionval = Condition¹val
    if isTemp(Bval) then
        RemoveTemp;
  End
  else if isTemp(Bval) then
    Conditionval = Bval;
  else Conditionval = NewTemp;
  Emitline(Conditionval + '=' +
  Condition¹val + 'and' + Bval);
  ConditionType = Condition¹Type;
  if (Condition¹Type != BType)
}       TypeError;
```

4) <Condition> → <Condition¹> OR <B>

```
{ if isTemp(Conditionval) then
  Begin
    Conditionval = Condition¹val;
    if isTemp(Bval) then
        RemoveTemp;
  End
  else if isTemp(Bval) then
    Conditionval = Bval;
  else Conditionval = NewTemp;
```

←

```
  Emitline(Conditionval + '=' +
    Condition¹val + 'or' + Bval);
  ConditionType = Condition¹Type
  if (Condition¹Type != BType) TypeError;
}
```

5) <Condition> → NOT <Condition'>

```
{ Emitline( Conditionval +
  '=' + 'not' + Condition'val
  ConditionType = Condition'Type;
}
```

6) <Condition> → <B>

```
{ Conditionval = Bval;
  ConditionType = BType; }
```

7) <B> → <E> Relop <E'>

```
{ if isTemp( E'val ) then
  Begin  Bval = Eval;
  if isTemp( E'val ) then
      RemoveTemp;
  end
  else if isTemp( E'val ) then
    Bval = E'val;
  else  Bval = NewTemp;
  Emitline( Bval + '=' + Eval +
          Relop + E'val );
  BType = boolean;
  if ( EType != E'Type) TypeError;
}
```

8) <B> → True

```
{ Bval = 'true';  BType = Boolean; }
```

9) <B> → False

```
{ Bval = 'false';  BType = boolean; }
```

10) <B> → id

```
{ Bval = id.lexval;  BType = boolean; }
```