Chapter9
Optimization

Example

```
(1)       read (C)
(2)       A:= 0
(3)       B:= 1
(4) L1: A:=A + B
(5)       if  B>= C  goto  L2
(6)       B:=B+1
(7)       goto  L1
(8) L2:  write (A)
(9)       halt
```

Program flow diagram

画程序流图

```
(1)      read (C)
(2)      A:= 0
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(4) L1: A:=A + B
(5)      if  B>= C  goto  L2
(6)      B:=B+1
(7)      goto  L1
(8) L2:  write (A)
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```

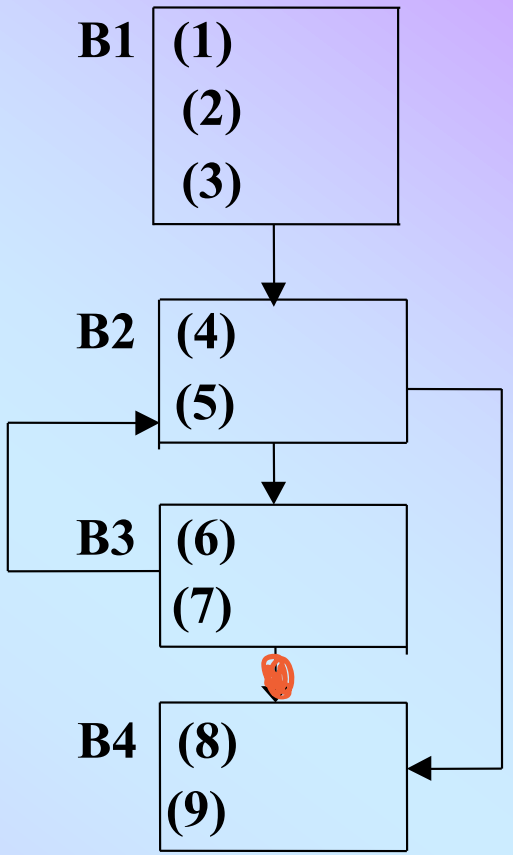

Exercise

1. Translate into QUAD CODE
2. Divide basic blocks
3. Draw program flow diagram

```
i = m - 1;   j = n;        v = a[ n ];
while( 1 ) {
   while( a[++i] < v );
   while( a[--j] > v );
   if( i >= j )                break;
   x = a[ i ];        a[ i ] = a[ j ];      a[ j ] = x;
}
x = a[ i ];   a[  i ] = a[ n ];    a[ n ] = x;
```

QUAD CODE & Basic Block

(1) i := m - 1
(2) j := n
(3) t1 := 4 * n;
(4) v := a[t1]
(5) i := i + 1
(6) t2 := 4 * i;
(7) t3 := a[t2];
(8) if t3 < v goto (5)
(9) j := j - 1
(10) t4 := 4 * j;

(11) t5 := a[t4];
(12) if t5 > v goto (9)
(13) if i >= j goto (23)
(14) t6 := 4 * i
(15) x := a[t6]
(16) t7 := 4 * i
(17) t8 := 4 * j
(18) t9 := a[t8]
(19) a[t7] := t9
(20) t10 := 4 * j

(21) a[t10] := x
(22) goto (5)
(23) t11 := 4 * i
(24) x := a[t11]
(25) t12 := 4 * i
(26) t13 := 4 * j
(27) t14 := a[t13]
(28) a[t12] := t14
(29) t15 := 4 * j
(30) a[t15] := x

Program flow diagram