

HW7

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9.1

- (a).
 $loop_1 = B_2, B_3, B_4, B_5$
 $loop_2 = B_3, B_4$
 $loop_3 = B_2, B_3, B_5$
 $loop_4 = B_2, B_5$
- (b).
(3), (4), (6), (8), (9)中的 a 均可以修改为1
而 b 不可以实施复写传播
- (c).
 $loop_1 = a + b, c - a$
 $loop_2 = null$
 $loop_3 = a + b, c - a$
 $loop_4 = a + b, c - a$
- (d).
 $loop_1 = b, c$
 $loop_2 = e$
 $loop_3 = b, c, e$
 $loop_4 = b, c, d, e$
- (e).
 $loop_1 = null$
 $loop_2 = a + b$
 $loop_3 = null$
 $loop_4 = null$

9.2

//优化后代码如下：

```
dp = 0
t1 = 0
n1 = 8 * n
L:
t2 = A[t1]
t4 = B[t1]
t5 = t2 * t4
dp = dp + t5
t1 = t1 + 8
if t1 < n1 goto L
```

9.3

- (a).
 - *gen, kill*如下：

	gen	kill
B1	(1),(2)	(10), (11)
B2	(3),(4)	(5),(6)
B3	(5)	(4),(6)
B4	(6),(7)	(4),(5),(9)
B5	(8),(9)	(2),(7),(11)
B6	(10), (11)	(1),(2),(8)

- *IN, OUT*迭代如下：

	IN_1	OUT_1	IN_2	OUT_2	IN_3	OUT_3
B1	null	(1),(2)	null	(1),(2)	null	(1),(2)
B2	(1),(2)	(1),(2), (3),(4)	(1),(2), (3),(4), (5),(8),(9)	(1),(2), (3),(4), (8),(9)	(1),(2), (3),(4), (5),(8),(9)	(1),(2), (3),(4), (8),(9)
B3	(1),(2), (3),(4)	(1),(2), (3),(5)	(1),(2), (3),(4), (6),(7), (8),(9)	(1),(2), (3),(5), (7),(8),(9)	(1),(2), (3),(4), (6),(7), (8),(9)	(1),(2), (3),(5), (7),(8),(9)

B4	(1),(2), (3),(5)	(1),(2), (3),(6),(7)	(1),(2), (3),(5), (7),(8),(9)	(1),(2), (3),(6), (7),(8)	(1),(2), (3),(5), (7),(8),(9)	(1),(2), (3),(6), (7),(8)
B5	(1),(2), (3),(4),(5)	(1),(3), (4),(5), (8),(9)	(1),(2), (3),(4), (5),(7), (8),(9)	(1),(3), (4),(5), (8),(9)	(1),(2), (3),(4), (5),(7), (8),(9)	(1),(3), (4),(5), (8),(9)
B6	(1),(3), (4),(5), (8),(9)	(3),(4), (5),(9), (10),(11)	(1),(3), (4),(5), (8),(9)	(3),(4), (5),(9), (10),(11)	(1),(3), (4),(5), (8),(9)	(3),(4), (5),(9), (10),(11)

• (b).

◦ e_gen, e_kill 如下:

	e_gen	e_kill
B1	1,2	a+b,c-a,a-d,b+d,b*d
B2	a+b,c-a	b+d,b*d,a-d
B3	null	b+d,b*d,a-d
B4	a+b	b+d,b*d,a-d,e+1
B5	c-a	a+b,b*d,b+d,e+1
B6	a-d	a+b,c-a,b+d,b*d

◦ IN, OUT 迭代如下:

	IN_1	OUT_1	IN_2	OUT_2
B1	null	1,2	null	1,2
B2	1,2	1,2,a+b,c-a	1,2	1,2,a+b,c-a
B3	1,2,a+b,c-a	1,2,a+b,c-a	1,2,a+b,c-a	1,2,a+b,c-a
B4	1,2,a+b,c-a	1,2,a+b,c-a	1,2,a+b,c-a	1,2,a+b,c-a
B5	1,2,a+b,c-a	1,2,a+b,c-a	1,2,c-a	1,2,c-a
B6	1,2,c-a	1,2,a-d	1,2,c-a	1,2,a-d

• (c).

◦ def, use 如下:

	use	def
B1	null	a,b
B2	a,b	c,d
B3	b,d	null
B4	a,b,e	d
B5	a,b,c	e
B6	b,d	a

◦ *IN, OUT*迭代如下：

	IN_1	OUT_1	IN_2	OUT_2	IN_3	OUT_3
B1	e	a,b,e	e	a,b,e	e	a,b,e
B2	a,b,e	a,b,c,d,e	a,b,e	a,b,c,d,e	a,b,e	a,b,c,d,e
B3	a,b,c,d,e	a,b,c,d,e	a,b,c,d,e	a,b,c,d,e	a,b,c,d,e	a,b,c,d,e
B4	a,b,e	null	a,b,c,e	a,b,c,d,e	a,b,c,e	a,b,c,d,e
B5	a,b,c,d	b,d	a,b,c,d	a,b,d,e	a,b,c,d	a,b,d,e
B6	b,d	null	b,d	null	b,d	null

9.15

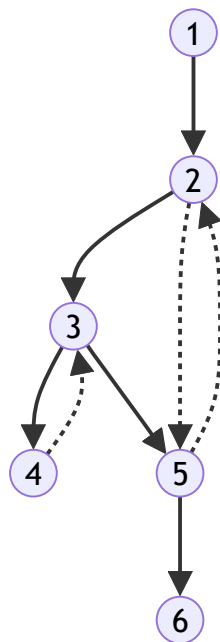
• (a).

支配关系迭代如下：

	IN_1	OUT_1(dom)	IN_2	OUT_2(dom)
1	null	1	null	1
2	1	1,2	1	1,2
3	1,2	1,2,3	1,2	1,2,3
4	1,2,3	1,2,3,4	1,2,3	1,2,3,4
5	1,2,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
6	1,2,3,4	1,2,3,4,6	1,2,3,4	1,2,3,4,6
7	1,2,3,4	1,2,3,4,7	1,2,3,4	1,2,3,4,7

8	1,2,3,4,7	1,2,3,4,7,8	1,2,3,4	1,2,3,4,7,8
9	1,2,3,4,7,8	1,2,3,4,7,8,9	1,2,3,4,7,8	1,2,3,4,7,8,9
10	1,2,3,4,7,8	1,2,3,4,7,8,10	1,2,3,4,7,8	1,2,3,4,7,8,10

• (f).
深度优先生成树如下：



由此可得如下结果：

回边	自然循环
4->3	3,4
5->2	2,3,4,5