

Homework #3 Solutions

Exercise 9.5.1

Solution:

	B1	B2	B3	B4
Anticipated. in	$x+y$		$x+y$	$x+y$
Anticipated. out		$x+y$		
Available. in		$x+y$		$x+y$
Available. out	$x+y$		$x+y$	$x+y$
Earliest	$x+y$		$x+y$	
Postponable. in				
Postponable. out				
Latest	$x+y$		$x+y$	
Used. in				$x+y$
Used. out			$x+y$	

Introduce a temp variable $t = x+y$ at block B3, and used it in blocks B3 and B4.

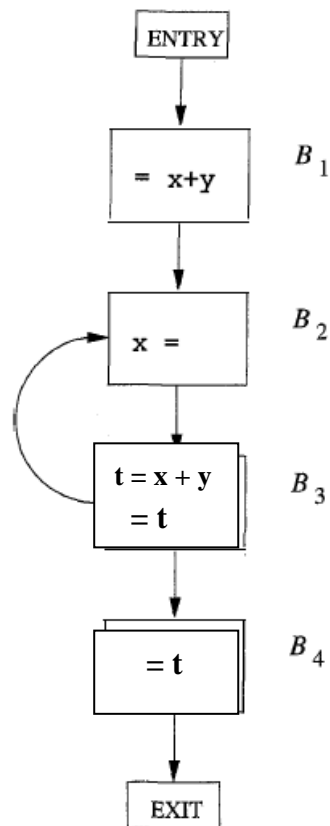


Figure 9.37: Flow graph for Exercise 9.5.1

Exercise 9.5.2 Solution:

Split B2 into two blocks.

B2a: $c = a+b$

B2b: $d = c-a$

Add an edge B2a \rightarrow B2b

	B1	B2a	B2b	B3	B4	B5	B6
Anticipated. in	\emptyset	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	$b*d$
Anticipated. out	$a+b$	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	\emptyset	\emptyset
Available. in	\emptyset	\emptyset	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	$c-a$
Available. out	\emptyset	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	$c-a$	\emptyset
Earliest	\emptyset	$a+b$	$c-a$	\emptyset	\emptyset	\emptyset	$b*d$
Postponable. in	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset
Postponable. out	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset
Latest	\emptyset	$a+b$	$c-a$	\emptyset	\emptyset	\emptyset	$b*d$
Used. in	\emptyset	\emptyset	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	\emptyset
Used. out	\emptyset	$a+b$	$a+b$ $c-a$	$a+b$ $c-a$	$a+b$ $c-a$	\emptyset	\emptyset

Results of lazy code motion:

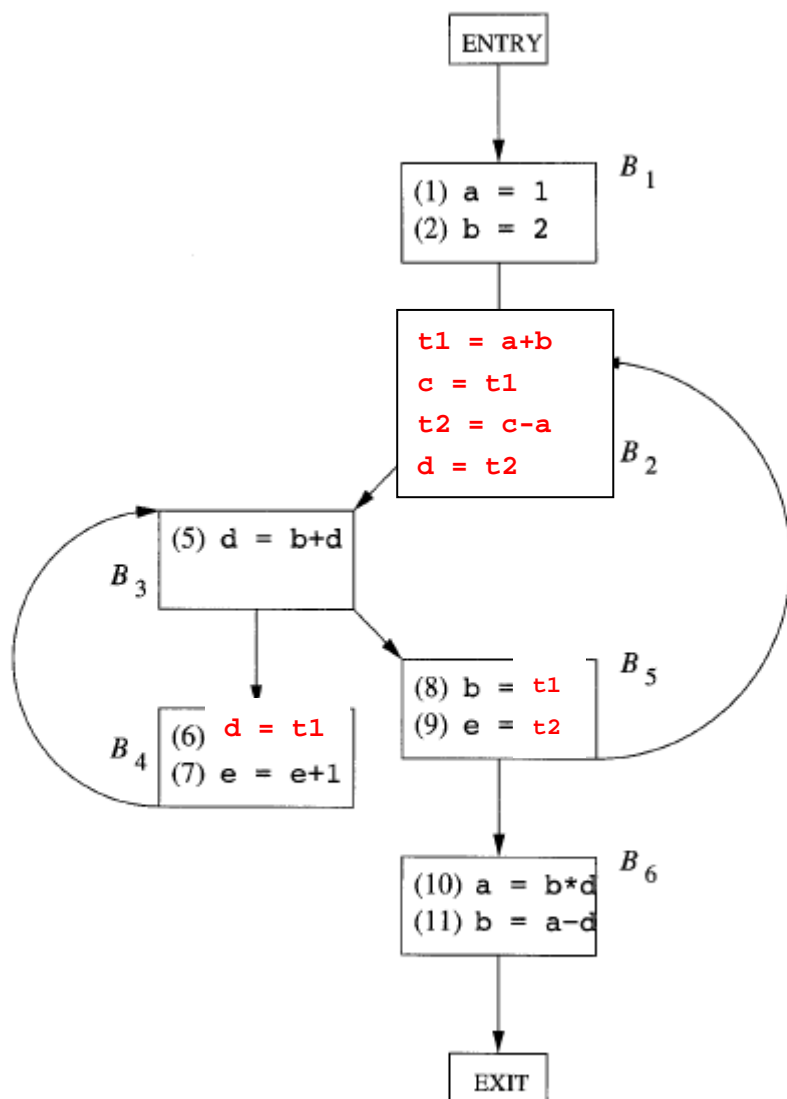


Figure 9.10: Flow graph for Exercise 9.1.1