Linguaggi e Compilatori
Assignment 2 - Gruppo 17

Es:1.1 (Very busy expressions)

	Dataflow Problem Very Busy Expressions
Domain	Sets of expressions
Direction	Backward $IN[b] = f_{b\,(OUT\,[b])}$ $OUT[b] = \hat{}\ IN_{\,[SUCC\,(b)]}$
Transfer function	$f_b(x) = GEN_b \cup (x - Kill_b)$
Meet Operation (^)	$\cap$
Boundary Condition	in[exit]= ∅
Initial interior points	in[b] = μ

Es:1.2

Bit Vector: (b-a, a-b)

	ITERAZIONE 1		ITERAZIONE 2		ITERAZIONE 3	
	in	out	in	out	in	out
BB1	1,1	1,1	1,0	1,0	1,0	1,0
BB2	1,1	1,1	1,0	1,0	1,0	1,0
BB3	1,1	1,1	1,1	0,1	1,1	0,1
BB4	1,1	∅	0,1	∅	0,1	∅
BB5	1,1	1,1	1,0	0,0	1,0	0,0
BB6	1,1	1,1	0,0	0,1	0,0	0,1
BB7	1,1	∅	0,1	∅	0,1	∅
BB8	∅	0,0	∅	∅	∅	∅

Es:2.1 (Dominator Analysis)

	Dataflow Problem Dominator Analysis
Domain	Sets of Basic Blocks
Direction	Forward $OUT[b] = f_{b\,(IN[b])}$ $IN[b] = \hat{} \; OUT_{\,[PREC\,(b)]}$
Transfer function	$f_b(x) = B \cup x$
Meet Operation (^)	$\cap$
Boundary Condition	out[entry]= entry
Initial interior points	out[b_i] = μ

Es:2.2

	ITERAZIONE 1		ITERAZIONE 2		ITERAZIONE 3	
	in	out	in	out	in	out
A	A	A	A	A	A	A
B	A	B	A	AB	A	AB
C	AC	C	A	AC	A	AC
D	AC	D	AC	ACD	AC	ACD
E	AC	E	AC	ACE	AC	ACE
F	∅	F	AC	ACF	AC	ACF
G	∅	G	A	AG	A	AG

Es:3.1 (Constant Propagation)

	Dataflow Problem Very Busy Expressions
Domain	Sets of <variable, constant value>
Direction	Forward OUT[b] = f_b (IN[b]) IN[b] = ^ OUT [PREC (b)]
Transfer function	$f_b(x) = GEN_b \cup (x - Kill_b)$
Meet Operation (^)	∩
Boundary Condition	out[entry]= μ
Initial interior points	out[b_i] = μ

L' insieme μ definisce la mancanza di conflitto nella definizione di valori nelle variabili.

	ITERAZIONE 1		ITERAZIONE 2		ITERAZIONE 3		ITERAZIONE 4	
	in	out	in	out	in	out	in	out
Entry	-	μ	-	-	-	-	-	-
1	μ	μ	-	(k,2)	-	(k,2)	-	(k,2)
2	μ	μ	(k,2)	(k,2)	(k,2)	(k,2)	(k,2)	(k,2)
3	μ	μ	(k,2)	(k,2) (a,4)	(k,2)	(k,2) (a,4)	(k,2)	(k,2) (a,4)
4	μ	μ	(k,2) (a,4)	(k,2) (a,4) (x,5)	(k,2) (a,4)	(k,2) (a,4) (x,5)	(k,2) (a,4)	(k,2) (a,4) (x,5)
5	μ	μ	(k,2)	(k,2) (a,4)	(k,2)	(k,2) (a,4)	(k,2)	(k,2) (a,4)
6	μ	μ	(k,2) (a,4)	(k,2) (a,4) (x,8)	(k,2) (a,4)	(k,2) (a,4) (x,8)	(k,2) (a,4)	(k,2) (a,4) (x,8)
7	μ	μ	(k,2) (a,4)	(k,4) (a,4)	(k,2) (a,4)	(k,4) (a,4)	(k,2) (a,4)	(k,4) (a,4)
8	μ	μ	(k,4) (a,4)	(k,4) (a,4)	(a,4)	(a,4)	(a,4)	(a,4)
9	μ	μ	(k,4) (a,4)	(b,2) (k,4) (a,4)	(a,4)	(a,4) (b,2)	(a,4)	(a,4) (b,2)
10	μ	μ	(b,2) (k,4) (a,4)	(b,2) (k,4) (a,4) (x,8)	(a,4) (b,2)	(a,4) (b,2)	(a,4) (b,2)	(a,4) (b,2)
11	μ	μ	(b,2) (k,4) (a,4) (x,8)	(b,2) (k,4) (a,4) (x,8) (y,8)	(a,4) (b,2)	(a,4) (b,2) (y,8)	(a,4) (b,2)	(a,4) (b,2) (y,8)
12	μ	μ	(b,2) (k,4) (a,4) (x,8) (y,8)	(b,2) (a,4) (x,8) (y,8) (k,5)	(a,4) (b,2) (y,8)	(a,4) (b,2) (y,8)	(a,4) (b,2) (y,8)	(a,4) (b,2) (y,8)
13	μ	μ	(k,4) (a,4)	(k,4) (a,4)	(a,4)	(a,4)	(a,4)	(a,4)
Exit	μ	μ	(k,4) (a,4)	(k,4) (a,4)	(a,4)	(a,4)	(a,4)	(a,4)