

SECONDO ASSIGNMENT COMPILATORI

1) Very busy expression

	Dataflow Problem 1
Domain	$\{a-b, b-a\}$
Direction	Backward
Transfer Function	$in[B] = gen[B] \cup (out[B] \setminus kill[B])$
Meet Operation (^)	\cap
Boundary Condition	$in[EXIT] = \emptyset$
Initial Interior Point	$OUT[B] = Domain$

	Iterazione 1	
	IN[B]	OUT[B]
BB1	b-a	b-a
BB2	b-a	b-a
BB3	a-b, b-a	a-b
BB4	a-b	\emptyset
BB5	b-a	\emptyset
BB6	\emptyset	a-b
BB7	a-b	\emptyset
BB8	\emptyset	\emptyset

2) Dominator Analysis

	Dataflow Problem 2
Domain	$\{A,B,C,D,E,F,G\}$
Direction	Forward
Transfer Function	$IN[B] = \{B\} \cup \cap IN[P] \ (P \in pred(B))$
Meet Operation (^)	\cap
Boundary Condition	$DOM[entry]=\{entry\}$
Initial Interior Point	$DOM[n]=\{A,B,C,D,E,F,G\}$

BB	Iterazione 1		Iterazione 2		Iterazione 3	
	IN[1]	OUT[1]	IN[2]	OUT[2]	IN[3]	OUT[3]
A	{A}	{A}	{A}	{A}	{A}	{A}
B	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B}	{A,B}	{A,B}	{A,B}
C	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,C}	{A,C}	{A,C}	{A,C}
D	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,C,D}	{A,C,D}
E	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,C,E}	{A,C,E}
F	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,C,F}	{A,C,F}
G	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,B,C,D,E,F,G,}	{A,G}	{A,G}

3) Constant Propagation:

	Dataflow Problem 2
Domain	$\text{Var} \rightarrow \text{Const} \cup \{\top\}$
Direction	Forward
Transfer Function	Aggiorna l'ambiente variabili
Meet Operation (^)	\cap
Boundary Condition	mappa vuota (nessuna variabile ha valore noto)
Initial Interior Point	T (valore sconosciuto)

BB	Iterazione 1		iterazione 2	
	IN[B]	OUT[B]	IN[B]	OUT[B]
BB1	\emptyset	\emptyset	\emptyset	\emptyset
BB2	\emptyset	$\{k = 2\}$	\emptyset	$\{k = 2\}$
BB3	$\{k = 2\}$	$\{k = 2\}$	$\{k = 2\}$	$\{k = 2\}$
BB4	$\{k = 2\}$	$\{k = 2, a = 4\}$	$\{k = 2\}$	$\{k = 2, a = 4\}$
BB5	$\{k = 2\}$	$\{k = 2, a = 4\}$	$\{k = 2\}$	$\{k = 2, a = 4\}$
BB6	$\{k=2, a=4\}$	$\{k=2, a=4, x = 5\}$	$\{k=2, a=4\}$	$\{k=2, a=4, x = 5\}$
BB7	$\{k = 2, a = 4\}$	$\{k=2, a = 4, x = 8\}$	$\{k = 2, a = 4\}$	$\{k=2, a = 4, x = 8\}$
BB8	$\{k=2, a = 4, x = \top\}$	$\{a = 4, x = \top, k = 4\}$	$\{k=2, a = 4, x = \top\}$	$\{a = 4, x = \top, k = 4\}$
BB9	$\{a = 4, x = \top, k = 4\}$	$\{a = 4, x = \top, k = 4\}$	$\{a = 4, x = \top, k = 4\}$	$\{a = 4, x = \top, k = 4\}$
BB10	$\{a = 4, x = \top, k = 4\}$	$\{a = 4, x = \top, k = 4, b=2\}$	$\{a = 4, x = \top, k = 4\}$	$\{a = 4, x = \top, k = 4, b=2\}$
BB11	$\{a = 4, k = 4, b = 2, x = \top\}$	$\{a = 4, b = 2, k = 4, x = 8\}$	$\{a = 4, k = 4, b = 2, x = \top\}$	$\{a = 4, b = 2, k = 4, x = 8\}$
BB12	$\{a = 4, b = 2, k = 4, x = 8\}$	$\{a = 4, b = 2, k = 4, x = 8, y = 8\}$	$\{a = 4, b = 2, k = 4, x = 8\}$	$\{a = 4, b = 2, k = 4, x = 8, y = 8\}$
BB13	$\{a = 4, b = 2, k = 4, x = 8, y = 8\}$	$\{k = \top, a = 4, b = 2, x = 8, y = 8\}$	$\{a = 4, b = 2, k = 4, x = 8, y = 8\}$	$\{k = \top, a = 4, b = 2, x = 8, y = 8\}$
BB14	$\{k = \top, a = 4, b = 2, x = 8, y = 8\}$	$\{a = 4, x = 8\}$	$\{k = \top, a = 4, b = 2, x = 8, y = 8\}$	$\{a = 4, x = 8\}$
BB15	$\{a = 4, x = 8\}$	$\{a = 4, x = 8\}$	$\{a = 4, x = 8\}$	$\{a = 4, x = 8\}$

