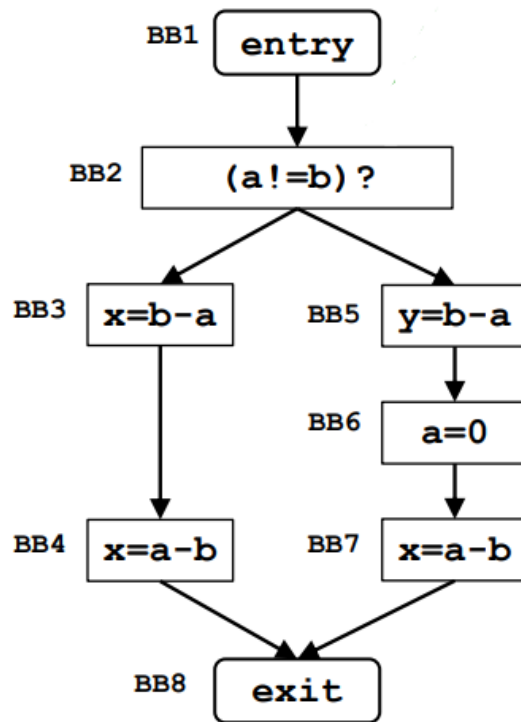


Very Busy Expression



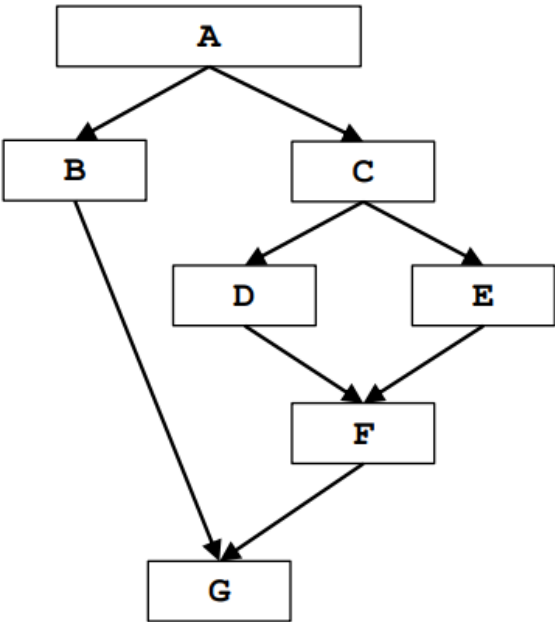
	Framework VBE
Domain	$D = \{b - a, a - b, a \neq b\}$
Direction	Backward: $IN_B = f_b(OUT_B)$ $OUT_B = \wedge IN(succ_B)$
Transfer Function	$f_b(x) = Gen_B \cup (x - Kill_B)$
Meet Operator	Intersezione \cap
Boundary Condition	$OUT[Exit] = \emptyset$
Initial Interior Points	$IN_B = \mathcal{U}$

	IN_B	OUT_B
BB1	$a \neq b, b - a$	$a \neq b, b - a$
BB2	$a \neq b, b - a$	$b - a$
BB3	$b - a, a - b$	$a - b$
BB4	$a - b$	\emptyset
BB5	$b - a$	\emptyset

	IN_B	OUT_B
BB6	\emptyset	$a - b$
BB7	$a - b$	\emptyset
BB8	\emptyset	\emptyset

Perciò possiamo dire che le VBE di questo pezzo di codice sono $a \neq b$ e $b - a$, poiché vengono valutate almeno una volta prima di essere ridefinite.

Dominator Analysis



$$DOM[F] = \{A, C, F\}$$

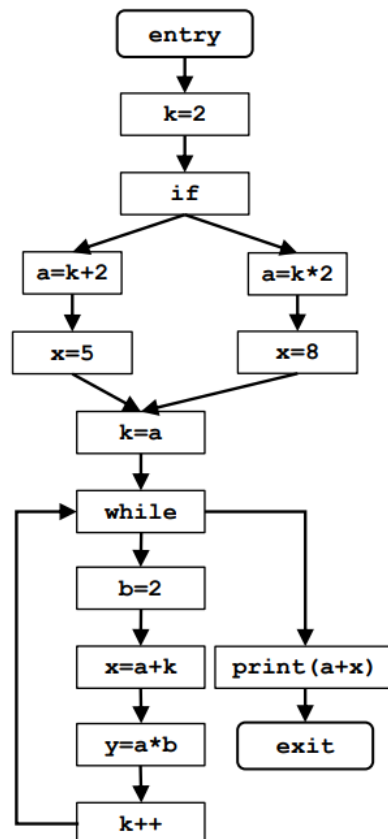
	Framework Dominators
Domain	$D = \{A, B, C, D, E, F, G\}$
Direction	Forward: $OUT_B = f_b(IN_B)$ $IN_B = \wedge OUT(pred_B)$
Transfer Function	$f_b(x) = B \cup x$
Meet Operator	Intersezione \cap
Boundary Condition	$OUT_A = A$

	Framework Dominators
Initial Interior Points	$OUT_B = U$

	IN_B	OUT_B
A	\emptyset	A
B	A	B, A
C	A	C, A
D	C, A	D, C, A
E	C, A	E, C, A
F	C, A	F, C, A
G	A	G, A

NOTA: la boundary condition serve posta così poiché l'intersezione di un insieme vuoto NON è un insieme vuoto.

Constant Propagation



	Framework CP
Domain	$D = \{[x, c]\}$ dove $[x, c]$ sono le coppie
Direction	Forward: $\text{OUT}_B = f_b(\text{IN}_B)$ $\text{IN}_B = \wedge \text{OUT}(\text{pred}_B)$
Transfer Function	$f_b(x) = \text{Gen}_B \cup (x - \text{Kill}_B)$
Meet Operator	Intersezione \cap
Boundary Condition	$\text{OUT}[\text{Entry}] = \emptyset$
Initial Interior Points	$\text{OUT}_B = \mathcal{U}$

BB	I1	I2
	IN_B	OUT_B
Entry	\emptyset	\emptyset
k=2	\emptyset	$[k, 2]$
if	$[k, 2]$	$[k, 2]$
a=k+2	$[k, 2]$	$[k, 2][a, 4]$
x=5	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 5]$
a=k*2	$[k, 2]$	$[k, 2][a, 4]$
x=8	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 8]$
k=a	$[k, 2][a, 4]$	$[a, 4][k, 4]$
while	$[a, 4][k, 4]$	$[a, 4][k, 4]$
b=2	$[a, 4][k, 4]$	$[a, 4][k, 4][b, 2]$
x=a+k	$[a, 4][k, 4][b, 2]$	$[a, 4][k, 4][b, 2][x, 8]$
y=a*b	$[a, 4][k, 4][b, 2][x, 8]$	$[a, 4][k, 4][b, 2][x, 8][y, 8]$
k++	$[a, 4][k, 4][b, 2][x, 8][y, 8]$	$[a, 4][b, 2][x, 8][y, 8][k, 5]$
print(a+x)	$[a, 4][k, 4]$	$[a, 4][k, 4]$
Exit	$[a, 4][k, 4]$	$[a, 4][k, 4]$

BB	I2	I2
	In_B	Out_B

BB	I2	I2
Entry	\emptyset	\emptyset
k=2	\emptyset	$[k, 2]$
if	$[k, 2]$	$[k, 2]$
a=k+2	$[k, 2]$	$[k, 2][a, 4]$
x=5	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 5]$
a=k*2	$[k, 2]$	$[k, 2][a, 4]$
x=8	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 8]$
k=a	$[k, 2][a, 4]$	$[a, 4][k, 4]$
while	$[a, 4]$	$[a, 4]$
b=2	$[a, 4]$	$[a, 4][b, 2]$
x=a+k	$[a, 4][b, 2]$	$[a, 4][b, 2]$
y=a*b	$[a, 4][b, 2]$	$[a, 4][b, 2][y, 8]$
k++	$[a, 4][b, 2][y, 8]$	$[a, 4][b, 2][y, 8]$
print(a+x)	$[a, 4]$	$[a, 4]$
Exit	$[a, 4]$	$[a, 4]$

Dalla terza in poi le iterazioni convergono.