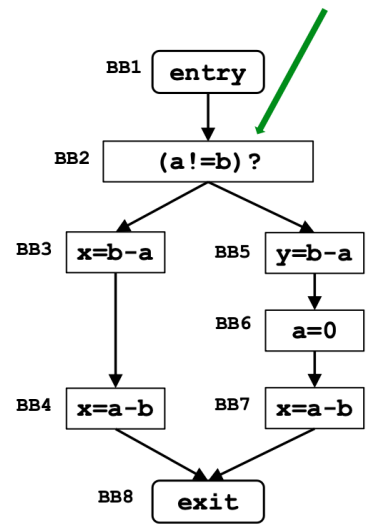


Very Busy Expressions

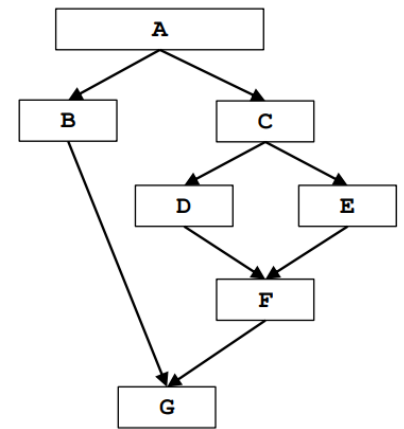
	Very Busy Expressions
Domain	Insieme delle espressioni { $b-a$, $a-b$ }
Direction	Backward: $\text{In}[B] = f_b[\text{Out}[B]]$ $\text{Out}[B] = \cap \text{In}[\text{Succ}[B]]$
Transfer Function	$f_b(x) = \text{Gen}_b \cup (\text{Out}_b - \text{Kill}_b)$
Meet Operator	\cap
Boundary Condition	$\text{In}[\text{exit}] = \emptyset$
Initial Interior Points	$\text{In}[b] = u$



BB	ITERAZIONE 1	
	IN [B]	OUT [B]
BB1	$b-a$	$b-a$
BB2	$b-a$	$(b-a, a-b) \cap b-a = b-a$
BB3	$b-a \cup a-b = (b-a, a-b)$	$a-b$
BB4	$a-b$	\emptyset
BB5	$b-a$	\emptyset
BB6	$\emptyset \cup ((a-b) \setminus (a-b, b-a)) = \emptyset$	$\text{In}[BB7] = a-b$
BB7	$a-b$	\emptyset
BB8	\emptyset	\emptyset

Dominator Analysis

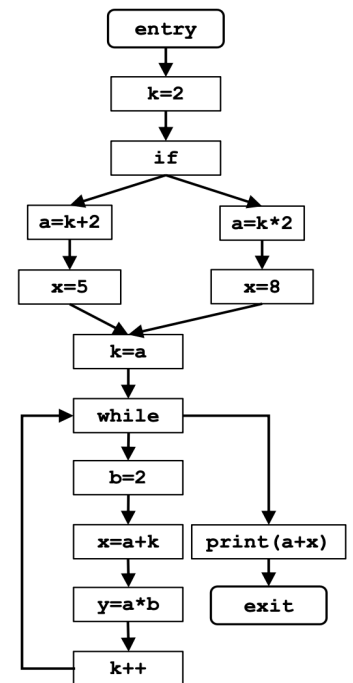
	Dominator Analysis
Domain	Insieme dei Basic Block { A,...,G }
Direction	Forward: $Out[B]=f_B(In [B])$ $In[B]= \cap Out[pred [B]]$
Transfer Function	$f_B=Gen_B \cup In_B$
Meet Operator	\cap
Boundary Condition	$Out[A]=A$
Initial Interior Points	$Out[b] = u$



BB	ITERAZIONE 1	
	IN [B]	OUT [B]
A	\emptyset	A
B	A	$B \cup In[B] = B, A$
C	A	$C \cup In[C] = C, A$
D	C, A	$D \cup In[D] = D, C, A$
E	C, A	$E \cup In[E] = E, C, A$
F	$Out[D] \cap Out[E] = C, A$	$F \cup In[F] = F, C, A$
G	$Out[B] \cap Out[F] = A$	$G \cup In[G] = G, A$

Constant Propagation Analysis

	Constant Propagation Analysis
Domain	Insieme delle coppie $\langle x, c \rangle$
Direction	Forward: $Out[B] = f_B(In[B])$ $In[B] = \cap Out[pred[B]]$
Transfer Function	$f_B = Gen_B \cup (In_B - Kill_b)$
Meet Operator	\cap
Boundary Condition	$Out[entry] = \emptyset$
Initial Interior Points	$Out[B] = u$



BB	ITERAZIONE 1		ITERAZIONE 2	
	IN [B]	OUT [B]	IN [B]	OUT [B]
ENTRY	\emptyset	\emptyset	\emptyset	\emptyset
k=2	\emptyset	$[k, 2]$	\emptyset	$[k, 2]$
IF	$[k, 2]$	$[k, 2]$	$[k, 2]$	$[k, 2]$
a=k+2	$[k, 2]$	$[k, 2][a, 4]$	$[k, 2]$	$[k, 2][a, 4]$
x=5	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 5]$	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 5]$
a=k*2	$[k, 2]$	$[k, 2][a, 4]$	$[k, 2]$	$[k, 2][a, 4]$
x=8	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 8]$	$[k, 2][a, 4]$	$[k, 2][a, 4][x, 8]$
k=a	$[k, 2][a, 4]$	$[a, 4]$	$[k, 2][a, 4]$	$[a, 4]$
WHILE	$[a, 4]$	$[a, 4]$	$[a, 4]$	$[a, 4]$
b=2	$[a, 4]$	$[a, 4][b, 2]$	$[a, 4]$	$[a, 4][b, 2]$
x=a+k	$[a, 4][b, 2]$	$[a, 4][b, 2]$	$[a, 4][b, 2]$	$[a, 4][b, 2]$
y=a*b	$[a, 4][b, 2]$	$[a, 4][b, 2][y, 8]$	$[a, 4][b, 2]$	$[a, 4][b, 2][y, 8]$
k++	$[a, 4][b, 2][y, 8]$	$[a, 4][b, 2][y, 8]$	$[a, 4][b, 2][y, 8]$	$[a, 4][b, 2][y, 8]$
PRINT(a+x)	$[a, 4]$	$[a, 4]$	$[a, 4]$	$[a, 4]$
EXIT	$[a, 4]$	$[a, 4]$	$[a, 4]$	$[a, 4]$