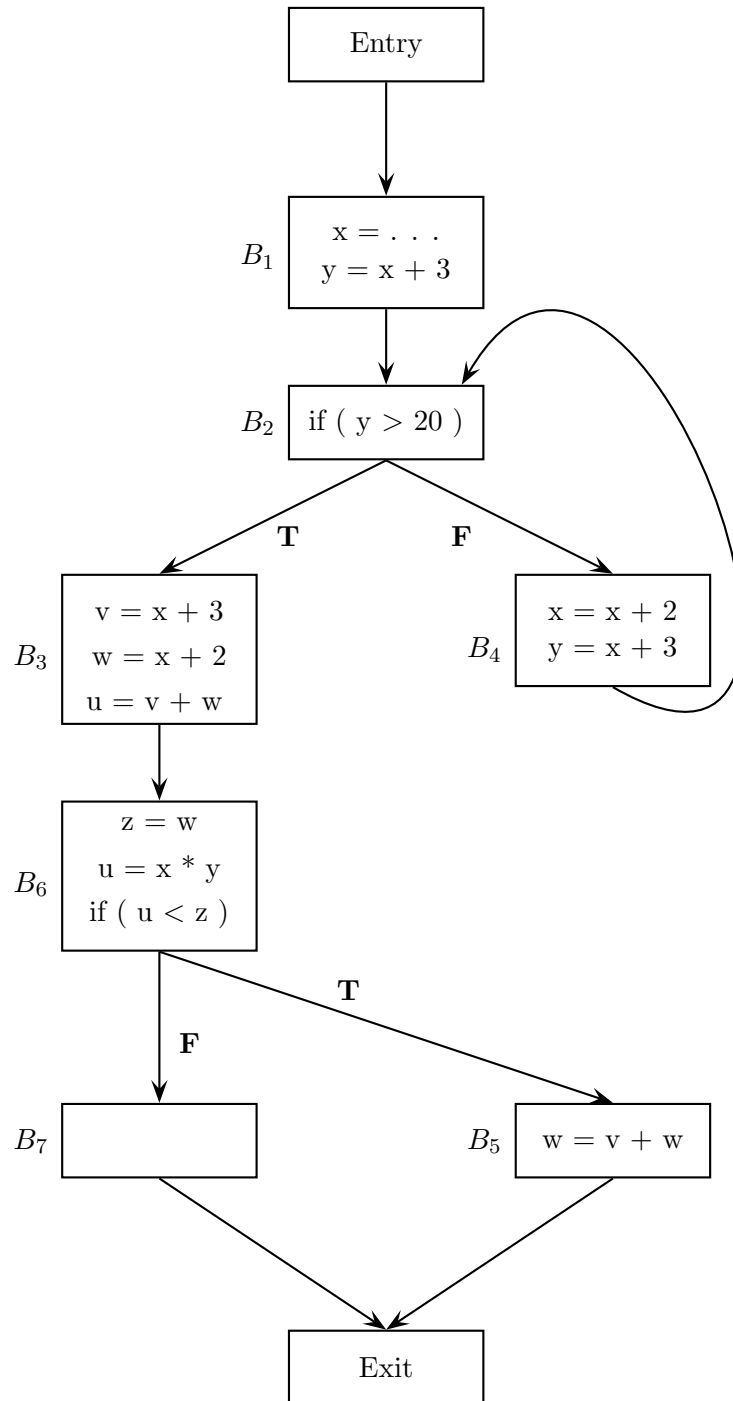


0.1 Solution 1



Solution 2

(a)

Expr: $\{x + 3, y > 20, x + 2, v + w, x * y, u < z\}$

BB	Gen	Kill
Exit	ϕ	ϕ
B7	0 0 0 0 0 0	0 0 0 0 0 0
B6	0 0 0 0 1 0	0 0 0 0 0 1
B5	0 0 0 1 0 0	0 0 0 1 0 0
B4	0 0 1 0 0 0	1 1 1 0 1 0
B3	1 0 1 0 0 0	0 0 0 1 0 1
B2	0 1 0 0 0 0	0 0 0 0 0 0
B1	0 0 0 0 0 0	1 1 1 0 1 0

(b)

$Out_n = \bigcap In_s$
 where $s \in \text{succ}(n)$

$In_n = Gen_n \cup (In_n - Kill_n)$

(c)

BB	Out	In
Exit	0 0 0 0 0 0	0 0 0 0 0 0
B7	0 0 0 0 0 0	0 0 0 0 0 0
B6	0 0 0 0 0 0	0 0 0 0 1 0
B5	0 0 0 0 0 0	0 0 0 1 0 0
B4	0 1 1 0 0 0	0 0 1 0 0 0
B3	0 0 0 0 1 0	1 0 1 0 1 0
B2	0 0 1 0 0 0	0 1 1 0 0 0
B1	0 1 1 0 0 0	0 0 0 0 0 0

Solution 3

(a)

Expr: $\{x + 3, y > 20, x + 2, v + w, x * y, u < z\}$

BB	Gen	Kill
Entry	0 0 0 0 0 0	0 0 0 0 0 0
B1	1 0 0 0 0 0	1 1 1 0 1 0
B2	0 1 0 0 0 0	0 0 0 0 0 0
B3	1 0 1 1 0 0	0 0 0 1 0 1
B4	1 0 0 0 0 0	1 1 1 0 1 0
B5	0 0 0 0 0 0	0 0 0 1 0 0
B6	0 0 0 0 1 1	0 0 0 0 0 1
B7	0 0 0 0 0 0	0 0 0 0 0 0
Exit	0 0 0 0 0 0	0 0 0 0 0 0

(b)

$In_n = \bigcup Out_p$
 where $p \in \text{pred}(n)$

$Out_n = Gen_n \bigcup (In_n - Kill_n)$

(c)

BB	Initial In	Initial Out
Entry	ϕ	ϕ
B1	ϕ	ϕ
B2	ϕ	ϕ
B3	ϕ	ϕ
B4	ϕ	ϕ
B5	ϕ	ϕ
B6	ϕ	ϕ
B7	ϕ	ϕ
Exit	ϕ	ϕ

(d)

BB	In	Out
Entry	0 0 0 0 0 0	0 0 0 0 0 0
B1	0 0 0 0 0 0	1 0 0 0 0 0
B2	1 0 0 0 0 0	1 1 0 0 0 0
B3	1 1 0 0 0 0	1 1 1 1 0 0
B4	1 1 0 0 0 0	1 0 0 0 0 0
B5	1 1 1 1 1 1	1 1 1 0 1 1
B6	1 1 1 1 0 0	1 1 1 1 1 1
B7	1 1 1 1 1 1	1 1 1 1 1 1
Exit	1 1 1 1 1 1	1 1 1 1 1 1