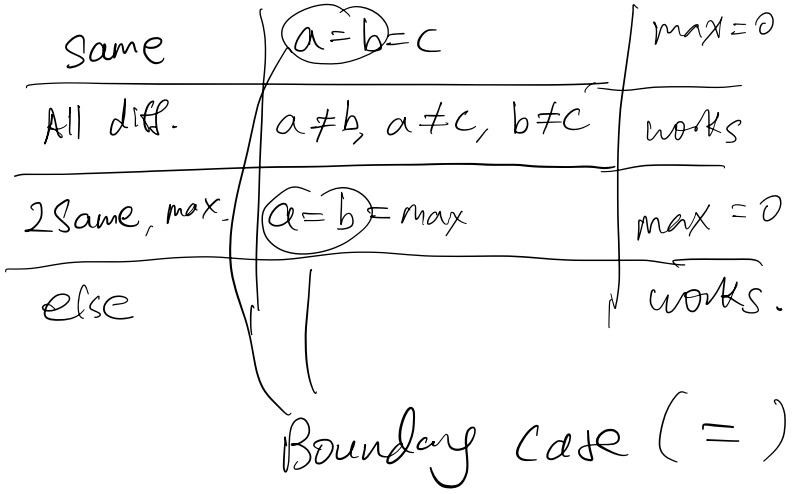
9.1

```
long max_of_three(long a, long b, long c) {
  long max = 0;
  if ((a > b) && (a > c)) {
    // a is larger than b and c
    max = a;
  }
  if ((b > a) && (b > c)) {
    // b is larger than a and c
    max = b;
  }
  if ((c > a) && (c > b)) {
    // c is larger than a and b
    max = c;
  }
  return max;
}
```



9.2

V(p)	V(q)	C(p)	C(q)	H(p,q)	Can?
Y	Y	*	*	*	Y
Y	N	*	Y	Y	Y
N	Y	Y	*	Y	Y
N	N	Y	Y	Y	Y

```
if (is_vaccinated(p) && is_vaccinated(q)) {
  return true;
}
// either p or q or both are not vaccinated
if (are_from_the_same_household(p,q))
  if (is_a_child(p) && !is_vaccinated(p) && is_vaccinated(q)) {
    return true;
  }
  if (is_a_child(q) && !is_vaccinated(q) && is_vaccinated(p)) {
    return true;
  }
  if (is_a_child(q) && is_a_child(p)) {
    return true;
  }
}
return false;
```

Not needed.

10.1

a) $!\,[(x>1)\ \&\&\ (y \neq 10)]$

$= [!(x>1)]\ ||\ [y = 10]$

$= x \leq 1\ ||\ y = 10$

b) $!(!\text{eating}\ \&\&\ \text{drinking})$

$= (!!\text{eating})\ ||\ (!\text{drinking})$

$= \text{eating}\ ||\ (!\text{drinking})$

c) $![(\text{has\_cs2030}\ ||\ \text{has\_cs2113})\ \&\&\ (\text{has\_cs2040c})]$

$= !(\text{has\_cs2030}\ ||\ \text{has\_cs2113})\ ||\ (!\ \text{has\_cs2040c})$

$= [(!\ \text{has\_cs2030})\ \&\&\ (!\ \text{has\_cs2113})]\ ||\ (!\ \text{has\_cs2040c})$

10.2

```
long score = 4;
if (something) {
 score = 10;
} else {
 score = 0;
}
// { ??? }
if (score == 4) {
 score = 1;
} else {
 score += 10;
}
// { ??? }
if (score >= 10) {
 cs1010_println_string("ok");
} else {
 cs1010_println_string("failed");
}
```

either

or

score $\in \{0, 10\}$

never happens.

always!

+10

score $\in \{10, 20\}$

always!

never < 10 !