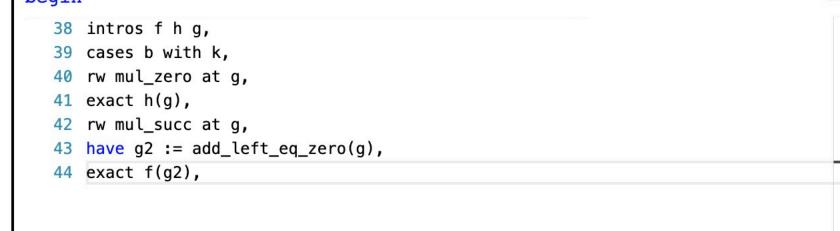
Theorem Proof:

```
The product of two non-zero natural numbers is non-zero.
theorem mul pos (a b : mynat) : a \neq 0 \rightarrow b \neq 0 \rightarrow a * b \neq 0 :=
begin
   38 intros f h g,
```



Theorem

If ab = 0, then at least one of a or b is equal to zero.

theorem eq_zero_or_eq_zero_of_mul_eq_zero (a b : mynat) (h : a * b = 0) :
 a = 0 v b = 0 :=

```
Proof:
```

```
begin

18 cases b,
19 right, refl,
20 rw mul_succ at h,
21 have h2:= add_left_eq_zero(h),
22 left,
```

end

23 exact h2,

```
Theorem

| ab = 0, if and only if at least one of a or b is equal to zero.
| theorem mul_eq_zero_iff (a b : mynat): a * b = 0 ↔ a = 0 ∨ b = 0 :=

Proof:
| begin
```

begin 17 split, 18 apply eq_zero_or_eq_zero_of_mul_eq_zero, 19 intro h, 20 cases h, 21 rw h, rw zero_mul, refl, 22 rw h, rw mul_zero, refl,

```
Theorem
If a \neq 0, b and c are natural numbers such that ab = ac, then b = c.
```

```
theorem mul left cancel (a b c : mynat) (ha : a \neq 0) : a * b = a * c \rightarrow b = c
   :=
Proof:
  begin
     56 induction c with d hd generalizing b,
     57 intro h,
     58 rw mul_zero at h,
     59 rw mul_eq_zero_iff at h,
     60 cases h with b,
     61 exfalso,
     62 exact ha(b)
     63 exact h,
     64 intro h,
     65 cases b,
     66 rw mul_zero at h,
     67 symmetry at h,
     68 rw mul_eq_zero_iff at h,
     69 cases h with b,
     70 exfalso, exact ha(b),
     71 symmetry, exact h,
     72 apply succ_eq_succ_of_eq,
     73 rw mul_succ at h,
     74 rw mul_succ at h,
     75 rw add_right_cancel_iff at h,
     76 have h1 :=hd(b),
     77 apply h1,
     78 exact h,
```