


FM-HW9

EX1

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 coq_ex.v

```
Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
```

1 subgoal
h1 : Prop

~~~~ h1 -> ~ h1 (1/1)

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Ready, proving ex1

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```
Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
```

1 subgoal  
h1 : Prop  
h2 : ~ ~ ~ h1  
  
~ h1 (1/1)

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Ready, proving ex1

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```

Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.

```

1 subgoal  
h1 : Prop  
h2 : ~ ~ ~ h1  
h3 : h1  
(1/1)  
False

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Ready, proving ex1
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```

Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.

```

1 subgoal  
h1 : Prop  
h3 : h1  
(1/1)  
~ ~ h1

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Ready, proving ex1
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```

Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.

```

1 subgoal

h1 : Prop

h3 : h1

h4 : ~ h1

(1/1)

False

Messages

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Ready, proving ex1

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```

Lemma ex1: forall A, ~~~A -> ~A.
Proof.
intro h1.
intro h2.
intro h3.
destruct h2.
intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.

```

1 subgoal

h1 : Prop

h3 : h1

(1/1)

h1

Messages

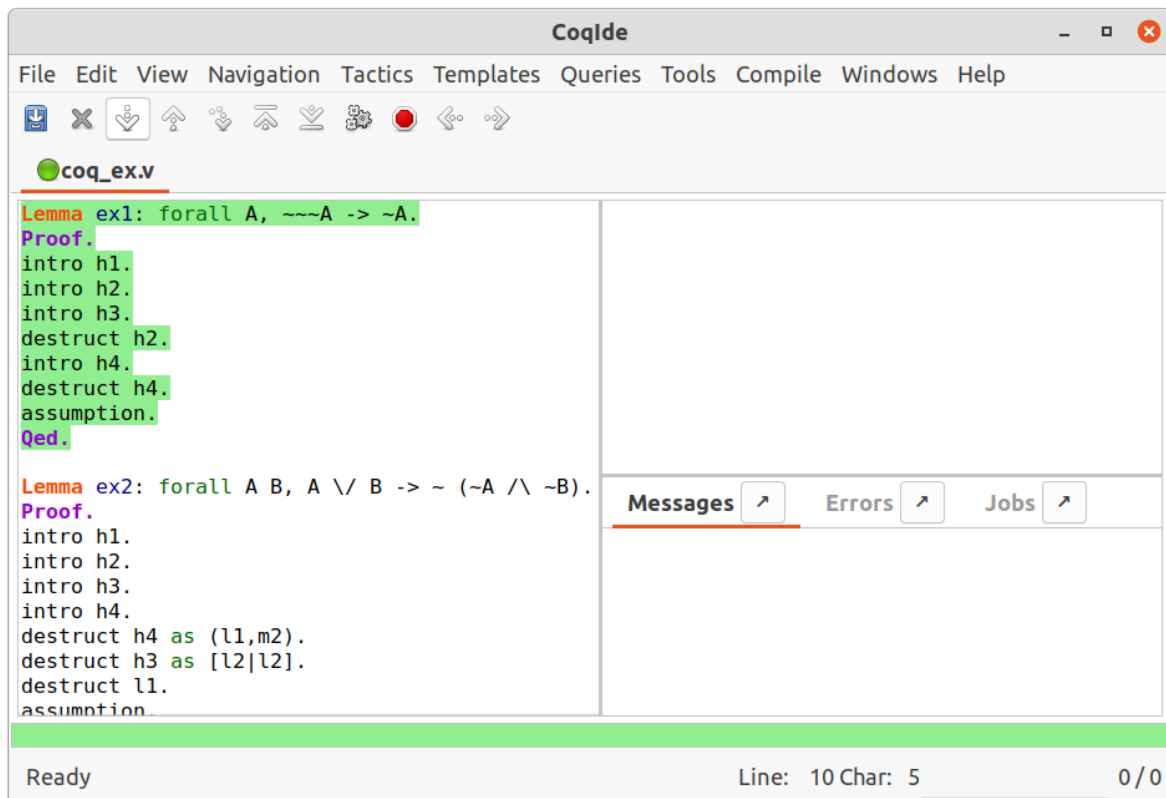
Errors

Jobs

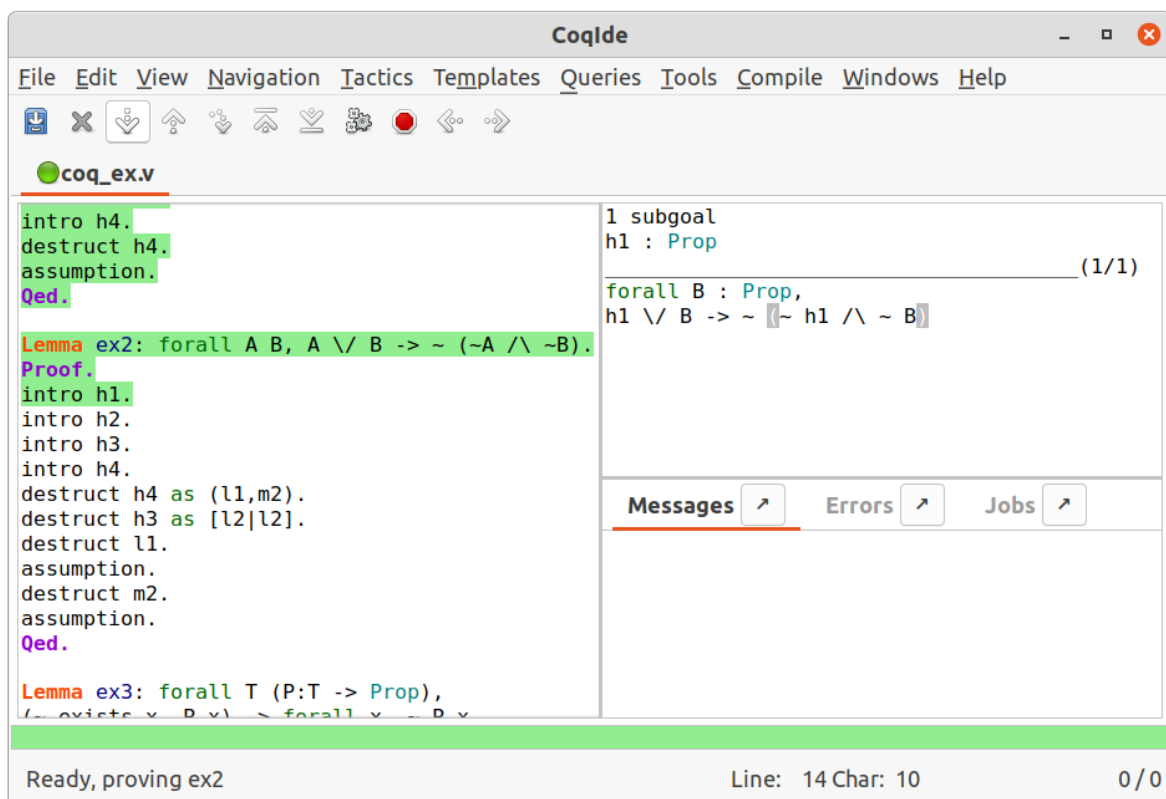
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## EX2



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```

intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A \ / B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
  (~ exists x, P x) -> forall x, ~ P x

```

1 subgoal

h1, h2 : Prop

h1 \ / h2 -> ~ (~ h1 /\ ~ h2) (1/1)

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Ready, proving ex2

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```

intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A \ / B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
  (~ exists x, P x) -> forall x, ~ P x

```

1 subgoal

h1, h2 : Prop

h3 : h1 \ / h2

~ (~ h1 /\ ~ h2) (1/1)

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Ready, proving ex2

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```

intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A \ / B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
  (~ exists x, P x) -> forall x, ~ P x

```

```

1 subgoal
h1, h2 : Prop
h3 : h1 \ / h2
h4 : ~ h1 /\ ~ h2
(1/1)
False

```

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Ready, proving ex2

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```

intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A \ / B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
  (~ exists x, P x) -> forall x, ~ P x

```

```

1 subgoal
h1, h2 : Prop
h3 : h1 \ / h2
l1 : ~ h1
m2 : ~ h2
(1/1)
False

```

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Ready, proving ex2

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intro h4.  
 destruct h4.  
 assumption.  
 Qed.  
  
 Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).  
 Proof.  
 intro h1.  
 intro h2.  
 intro h3.  
 intro h4.  
 destruct h4 as (l1,m2).  
 destruct h3 as [l2|l2].  
 destruct l1.  
 assumption.  
 destruct m2.  
 assumption.  
 Qed.  
  
 Lemma ex3: forall T (P:T -> Prop),  
 (~ exists x, P x) -> forall x, ~ P x

2 subgoals  
 h1, h2 : Prop  
 l2 : h1  
 l1 : ~ h1  
 m2 : ~ h2  
 (1/2)  
 False  
 (2/2)  
 False

Messages

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Jobs

Ready, proving ex2

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intro h4.  
 destruct h4.  
 assumption.  
 Qed.  
  
 Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).  
 Proof.  
 intro h1.  
 intro h2.  
 intro h3.  
 intro h4.  
 destruct h4 as (l1,m2).  
 destruct h3 as [l2|l2].  
 destruct l1.  
 assumption.  
 destruct m2.  
 assumption.  
 Qed.  
  
 Lemma ex3: forall T (P:T -> Prop),  
 (~ exists x, P x) -> forall x, ~ P x

2 subgoals  
 h1, h2 : Prop  
 l2 : h1  
 m2 : ~ h2  
 (1/2)  
 h1  
 (2/2)  
 False

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Ready, proving ex2

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```

intro h4.
destruct h4.
assumption.
Qed.

Lemma ex2: forall A B, A /\ B -> ~ (~A /\ ~B).
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.

```

1 subgoal

h1, h2 : Prop

l2 : h2

l1 : ~ h1

m2 : ~ h2

(1/1)

False

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Ready, proving ex2

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coq\_ex.v

```

intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.

```

1 subgoal

h1, h2 : Prop

l2 : h2

l1 : ~ h1

(1/1)

h2

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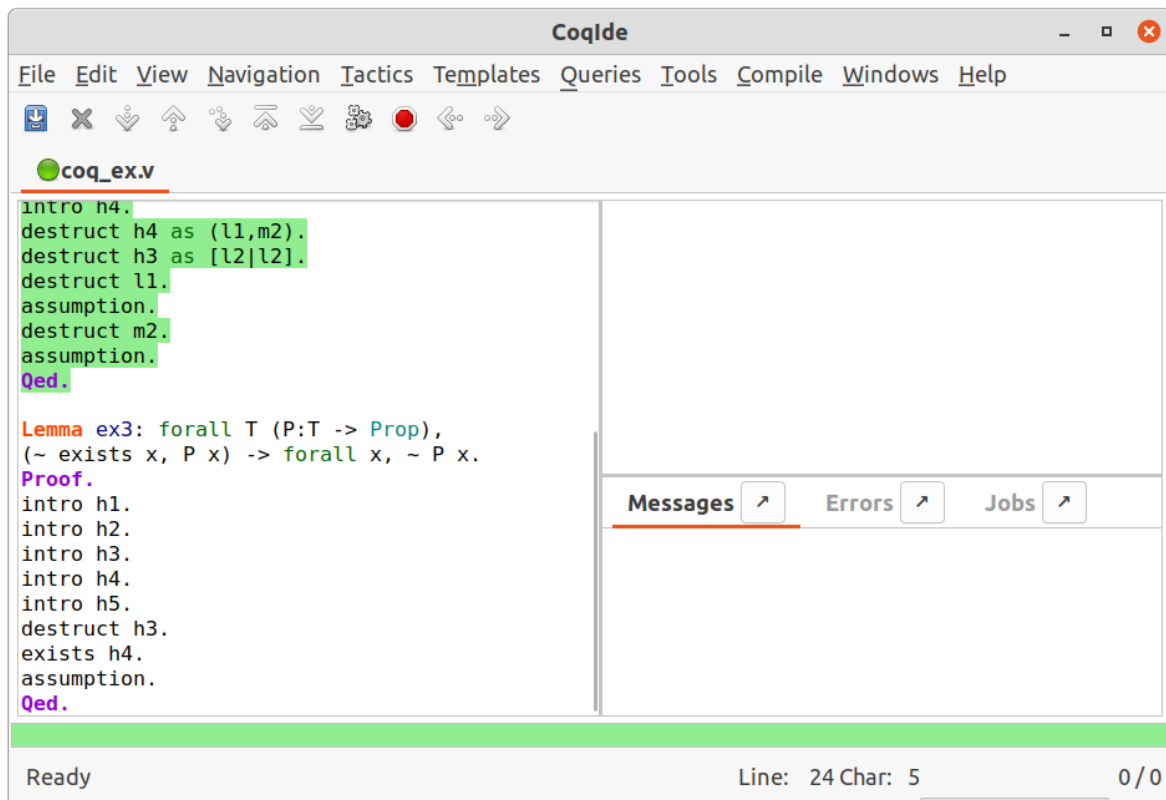
Jobs

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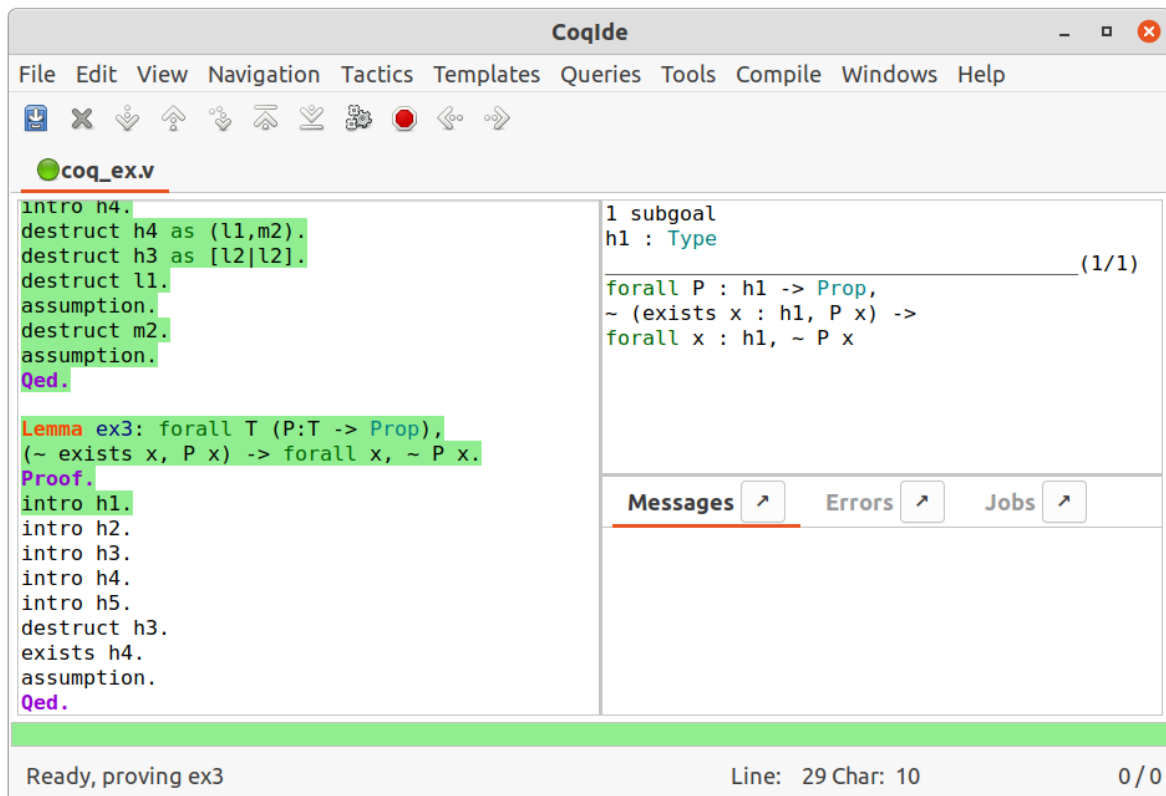
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## EX3



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intro n4.  
 destruct h4 as (l1,m2).  
 destruct h3 as [l2|l2].  
 destruct l1.  
 assumption.  
 destruct m2.  
 assumption.  
 Qed.

1 subgoal  
 h1 : Type  
 h2 : h1 -> Prop  
 \_\_\_\_\_ (1/1)  
 ~ (exists x : h1, h2 x) ->  
 forall x : h1, ~ h2 x

Messages

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Ready, proving ex3
 

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coq\_ex.v

intro n4.  
 destruct h4 as (l1,m2).  
 destruct h3 as [l2|l2].  
 destruct l1.  
 assumption.  
 destruct m2.  
 assumption.  
 Qed.

1 subgoal  
 h1 : Type  
 h2 : h1 -> Prop  
 h3 : ~ (exists x : h1, h2 x)  
 \_\_\_\_\_ (1/1)  
 forall x : h1, ~ h2 x

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Ready, proving ex3
 

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coq\_ex.v

```

intro n4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.

```

1 subgoal  
h1 : Type  
h2 : h1 -> Prop  
h3 : ~ (exists x : h1, h2 x)  
h4 : h1  
  
~ h2 h4

(1/1)

Messages

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Jobs

Ready, proving ex3

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coq\_ex.v

```

intro n4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.

```

1 subgoal  
h1 : Type  
h2 : h1 -> Prop  
h3 : ~ (exists x : h1, h2 x)  
h4 : h1  
h5 : h2 h4  
  
False

(1/1)

Messages

Errors

Jobs

Ready, proving ex3

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coq\_ex.v

```

intro n4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.

```

```

1 subgoal
h1 : Type
h2 : h1 -> Prop
h4 : h1
h5 : h2 h4
(1/1)
exists x : h1, h2 x

```

Messages

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Jobs

Ready, proving ex3

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coq\_ex.v

```

intro n4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.

```

```

1 subgoal
h1 : Type
h2 : h1 -> Prop
h4 : h1
h5 : h2 h4
(1/1)
h2 h4

```

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Jobs










Ready, proving ex3

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coq\_ex.v

```
intro h4.
destruct h4 as (l1,m2).
destruct h3 as [l2|l2].
destruct l1.
assumption.
destruct m2.
assumption.
Qed.

Lemma ex3: forall T (P:T -> Prop),
(~ exists x, P x) -> forall x, ~ P x.
Proof.
intro h1.
intro h2.
intro h3.
intro h4.
intro h5.
destruct h3.
exists h4.
assumption.
Qed.
```

Messages ↗

Errors ↗

Jobs ↗

Ready

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