```
decidable__disjoint  THM

⊢  ∀eq:(T→T→𝔹), L1,L2:T List. Dec(disjoint(eq;L1;L2))  by UnivCD
|
1. T : Type
2. eq : T→T→𝔹
3. L1 : T List
4. L2 : T List
⊢  Dec(disjoint(eq;L1;L2))  by ListInd 3
|
|\
| ⊢  Dec(disjoint(eq;nil;L2))
|   by Unfold ‘disjoint‘ 0 THEN Rewrite (HigherC list_all_unrollC) 0
|      THEN
|      ProveDecidable
|
.\
. 5. u : T
. 6. v : T List
. 7. Dec(disjoint(eq;v;L2))
. ⊢  Dec(disjoint(eq;(u.v);L2))
. | by OnHyps [-1;0] (λi.Unfold ‘disjoint‘ i)
. |    THEN
. |    Rewrite (HigherC list_all_unrollC) 0
. |
. 7. Dec(∀x∈v.¬₂x(∈eq) L2)
. ⊢  Dec(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)  by Decide ¬₂u(∈eq) L2
. |
. |\
. | 8. ¬₂u(∈eq) L2
. | ⊢  Dec(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)  by Analyze 7
. | |
. | |\
. | | 7. ∀x∈v.¬₂x(∈eq) L2
. | | 8. ¬₂u(∈eq) L2
. | | ⊢  Dec(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)
. | |   by UnfoldTopAb 0 THEN DNth 1 0
. | |
. | .\
. | . 7. ¬∀x∈v.¬₂x(∈eq) L2
. | . 8. ¬₂u(∈eq) L2
. | . ⊢  Dec(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)
. | . | by UnfoldTopAb 0 THEN DNth 2 0
. | . |
. | . ⊢  ¬(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)  by Analyze 0
. | . |
. | . 9. ¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2
. | . ⊢  False  by Analyze 9
. | . |
. | . 9. ¬₂u(∈eq) L2
. | . 10. ∀x∈v.¬₂x(∈eq) L2
. | . ⊢  False  by Analyze 7
. |
. .\
. . 8. ¬¬₂u(∈eq) L2
```

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. . ⊢  Dec(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)
. . | by UnfoldTopAb 0 THEN DNth 2 0
. . |
. . ⊢  ¬(¬₂u(∈eq) L2 & ∀x∈v.¬₂x(∈eq) L2)  by Analyze 7 THEN Analyze 0
END
```