**Exercise 1.1**

Hypotheses:

**Exercise 1.2**

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|  |  |  |  |  |  |  |  |  |  |
| T | T | T | F | F | F | F | T | T |  |
| T | T | F | F | F | T | F | T | T |  |
| T | F | T | F | T | F | F | T | T |  |
| T | F | F | F | T | T | F | T | T |  |
| F | T | T | T | F | F | F | T | T |  |
| F | T | F | T | F | T | F | T | T |  |
| F | F | T | T | T | F | T | F | F |  |
| F | F | F | T | T | T | T | F | T | T |

Premises have been highlighted in a pastel green. Conclusions have only been evaluated where all premises are true. QED we have a tautology.

**Exercise 2**

1. All pets are docile.

, where D(x) determines, if x is docile and P is the set of all pets.

There exists a pet which is not docile.

1. For any odd integer, its square is also odd.

where Odd(x) determines if x is odd and O is the set of all odd integers.

There exists at least one odd integer, whose square is not odd.

1. There is a country with no neighbours.

where HN(x) determines if x has at least one neighbour and C is the set of all countries.

All countries has at least one neighbouring country.

1. All football games have a winner team.

where HW(x) determines if x has a winner and FG is the set of all football games.

It is possible for a football game to end without a winner.

1. There is a natural number that is negative.

where Neg(x) determines if a number is negative and is the set of all natural numbers.

All natural numbers are not negative.

**Exercise 3**

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| --- | --- |
| Hypotheses | Abbreviations |
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