**Assignment 3**

1. **Let D be the statement "The dollar is strong", Y the statement "The Yuan is strong" and T the statement "New US-China trade agreement signed". Express the main content of each of the following (fictitious) newspaper headlines in logical notation. (Remember, logical notation captures truth, but not many nuances and inferences of natural language.) As before, make sure you could justify and defend your answers.**
   1. **New trade agreement will lead to strong currencies in both countries.**

T => D ^ Y

"will lead to" can be seen as a conditional. The possibility about the future cannot be given limitation of the notations.

* 1. **Strong Dollar means a weak Yuan.**

D => ~Y

* 1. **Trade agreement fails on news of weak Dollar.**

~D => ~T

* 1. **If new trade agreement is signed, Dollar and Yuan can't both remain strong.**

T => (~D v ~Y)

* 1. **Dollar weak but Yuan strong, following new trade agreement.**

T => ~D ^ Y

* 1. **If the trade agreement is signed, a rise in the Yuan will result in a fall of the Dollar**.

T => (Y => ~D)

* 1. **New trade agreement means Dollar and Yuan will rise and fall together.**

T => (D <=> Y)

* 1. **New trade agreement will be good for one side, but no one knows which.**

T => (D xor Y)

1. **Completed truth table:**

| **P** | **~P** | **S** | **P => S** | **~P V S** |
| --- | --- | --- | --- | --- |
| T | F | T | T | T |
| T | F | F | F | F |
| F | T | T | T | T |
| F | T | F | T | T |

1. **What conclusions can you draw from the table?**

The two expressions; P => S and ~P V S are equivalent. They express the same logic.

1. **Complete the following truth table. (Recall that P /=> S is another way of writing ~[P => S].)**

| **P** | **S** | **~S** | **P => S** | **P /=> S** | **P ^ ~S** |
| --- | --- | --- | --- | --- | --- |
| T | T | F | T | F | F |
| T | F | T | F | T | T |
| F | T | F | T | F | F |
| F | F | T | T | F | F |

1. What conclusions can you draw from the above table?

The two expressions; P /=> S and P ^ ~S are equivalent.