# Assignment 3 (for Lecture 3) Solutions

April 7, 2017

A1.

(a) $T \Longrightarrow D \wedge Y$

(b) $D \Longrightarrow \neg Y$

(c) $\neg D \Longrightarrow \neg T$

(d) $T \Longrightarrow (D \wedge \neg Y) \vee (\neg D \wedge Y)$

(e) $T \Longrightarrow \neg D \wedge Y$

(f) $T \Longrightarrow (Y \Longrightarrow \neg D)$

(g) $T \Longrightarrow (D \wedge Y) \vee (\neg D \wedge \neg Y)$

(h) $T \Longrightarrow (D \wedge \neg Y) \vee (\neg D \wedge Y)$

A2.

| $\phi$ | $\neg\phi$ | $\psi$ | $\psi \Longrightarrow \phi$ | $\neg\phi \vee \psi$ |
|---|---|---|---|---|
| T | F | T | T | T |
| T | F | F | F | F |
| F | T | T | T | T |
| F | T | F | T | T |

A3. $\psi \Longrightarrow \phi$ is equivalent to $\neg\phi \vee \psi$.

A4.

| $\phi$ | $\psi$ | $\neg\psi$ | $\phi \Longrightarrow \psi$ | $\neg(\phi \Longrightarrow \psi)$ | $\phi \wedge \neg\psi$ |
|---|---|---|---|---|---|
| T | T | F | T | F | F |
| T | F | T | F | T | T |
| F | T | F | T | F | F |
| F | F | T | T | F | F |

A5. $\neg(\phi \Longrightarrow \psi)$ is equivalent to $\phi \wedge \neg\psi$.