

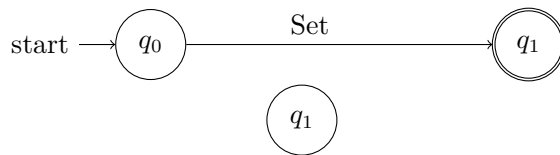
# Logic in Computer Science Assignment 1

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## 1 证明

**1.1**  $\neg(p \wedge q) \dashv\vdash \neg q \vee p$



**1.2**  $p \rightarrow q \dashv\vdash \neg q \rightarrow \neg p$ 

正向:

1	$p \rightarrow q$	premise
2	$\neg q$	assumption
3	$\neg p$	MT 1, 2
4	$\neg q \rightarrow \neg p$	$\rightarrow$ i 2 – 3

逆向:

1	$\neg q \rightarrow \neg p$	premise
2	$p$	assumption
3	$\neg\neg p$	$\neg\neg$ i 2
4	$\neg\neg q$	MT 1, 3
5	$q$	$\neg\neg$ e 4
6	$p \rightarrow q$	$\rightarrow$ i 2 – 5

**1.3**  $p \wedge q \rightarrow p \dashv\vdash r \vee \neg r$ 

正向:

$$1 \quad r \vee \neg r \quad \text{LEM}$$

逆向:

1	$p \wedge q$	assumption
2	$p$	$\wedge$ e <sub>1</sub> 1
3	$p \wedge q \rightarrow p$	$\rightarrow$ i 1 – 2