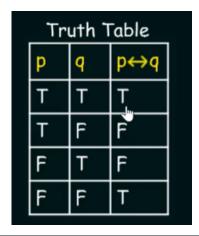
# Lecture 10. Logical Operators — Biconditional Operator (双条件运算符)

Biconditional Operator(双条件运算符),通常用符号"→"表示,是一个用于表示两个命题之间相互等价的逻辑运算符



## How "p if and only if q" make sense?

"p if and only if q" composed of two statements - "p if q" and "p only if q".

"p only if q" = if p then q and "p if q" = if q then p

$$(p \rightarrow q)$$
  $(q \rightarrow p)$   $\equiv$   $p \leftrightarrow q$ 

#### **Repersentations:**

- 1. p is necessary and suffucuent for q and voce versa (p 对于 q 来说是充分必要的,反之亦然)
- 2. if p then q, and conversely (如果 p 则 q,反之亦然)
- 3. p iff q (p 当且仅当 q)

#### **Homework Problem:**

### Write each of the following propositions in of the form "p if and only if q"

- (1) If you read newspaper everyday, you will be informed and conversely.
- (2) It rains if it is a weekend day, and it is a weekend day if it rains.
- (3) The trains run late on exactly those days when I take it.
- (4) For you to get an A in this course, it is necessary and sufficient that you learn how to solve discrete mathematics problems.
- 1. You will be informed and conversely if and only if you read newspaper everyday.
- 2. It rains if and only if it is a weekend day.

- 3. The trains run late if and only if I take it.
- 4. You can get an A in this course if and only if you learn how to solve discrete mathematics problems.