

## True or False?

For the purposes of this slide, Alice always carries an umbrella, Bob never carries an umbrella, and it is sunny out right now.

If it is sunny right now, then Alice has her umbrella.

If it is raining right now, then Alice has her umbrella.

If Bob has his umbrella, then it is raining right now.

If it is sunny right now, then Bob has his umbrella.

## Contrapositives

There are two equivalent ways to write an implication

$p \rightarrow q$  and  $\neg q \rightarrow \neg p$

How do I know they're equivalent?

$p$	$q$	$p \rightarrow q$	$\neg p$	$\neg q$	$\neg q \rightarrow \neg p$
True	True	True	False	False	
True	False	False	False	True	
False	True	True	True	False	
False	False	True	True	True	

## Even/Odd

Let  $a$  be an integer. If  $a^2$  is even, then  $a$  is even.

Try taking the contrapositive and proving that instead!

## Gale-Shapley

If  $r$  is not matched to  $h$  by Gale-Shapley, then at least one of  $h$  or  $r$  does not have the other as their first choice.