

# CSE 20

## Lecture 7: Introduction to Logic

# Next Week's Reading Assignment

- Section 1 (Propositional Logic) in Unit Lo: Logic.

# Proof styles

- Direct Proof (Case Analysis or just simple algebra analysis)

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Mathematically prove that these proof techniques work.

# Mathematical logic

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- A statement can have an unspecified term, called variable.
- Statements are connected to each other by 5 connectives: OR ( $\vee$ ), AND ( $\wedge$ ), NOT ( $\neg$ ), IMPLIES ( $\implies$ ) and IFF ( $\iff$ ).



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- TRUE statements proves a TRUE statement.

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# The IMPLIES ( $\implies$ )

- TRUE statements proves a TRUE statement.
- TRUE statements cannot proves a FALSE statement.
- FALSE statement can prove any statement.

# Example of False implying anything

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“If  $2 + 2 = 5$  then you are pope.”

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“If  $2 + 2 = 5$  then you are pope.”

Let  $2 + 2 = 5$ .

But we know  $2 + 2 = 4$ .

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So  $5 = 4$  and so subtracting 3 from both sides  $2 = 1$



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So 2 person = 1 person.

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So 2 person = 1 person.

So YOU and POPE are 1 person and hence you are pope.