305 Lecture 3.2 - Tautologies

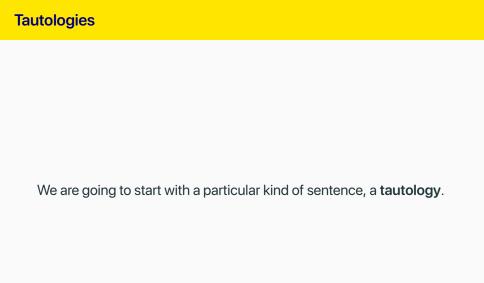
Brian Weatherson



This lecture is about how we use truth tables to check for whether something is a **tautology**.

Associated Reading

forall x, chapter 12, especially section 12.1.





A tautology is a sentence that gets the value $\ensuremath{\mathbb{T}}$ in every row of its truth table.



What are some sentences that might fit the bill?

The Law of Excluded Middle

The Law of Non-Contradiction

Reflexive Conditionals

$$\begin{array}{c|cccc}
A & A \rightarrow A \\
\hline
T & T & T \\
\hline
F & F & F
\end{array}$$

A Surprising One

Tautologies and Logical Truth

- All tautologies are logical truths.
- But the converse isn't true some logical truths are not tautologies.
- E.g., If Brian is necessarily a human, then Brian is a human.



We will start using truth tables to look at whether arguments are valid.