

Lecture 2

CIS 5000: SOFTWARE FOUNDATIONS

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TODO (for you)

- Before next class:
 - Check out Ed Discussion (let us know if you are not registered)
 - Try to log in to Gradescope
 - Download Poll Everywhere app on your phone
 - Install VSCode + Coq
 - Start reading: Preface and Basics
- HW1: Exercises in Basics.v
 - Due: Tuesday, September 3rd at 10:00PM
 - Available from course web page
 - Complete all non-optional exercises
 - There are no “advanced” problems for this HW
 - Submit via Gradescope

Coq in a Nutshell

- **Calculus (of Inductive Constructions)**
 - *Calculus*: a formal system for computing with / simplifying symbolic expressions
- **Types**
 - Types *classify* data values
 - Introduced by the “**I**nductive” keyword
 - Characterized by *constructors* that enumerate possible values
 - we can **C**heck the type of an expression.
- **Functional programming**
 - Functions define outputs for given inputs
 - Introduced by the “**D**efinition” keyword
 - can use “**m**atch” to examine the structure of values
 - we can **C**ompute an answer.
- **Interactive theorem prover**
 - We can prove an **E**xample or **T**heorem
 - using *tactics* (like “**s**impl” or “**r**eflexivity”)

Continuing with Coq...

BASICS.V