Dependent types
CS 152 (Spring 2020)

Harvard University

Tuesday, April 14, 2020
Announcements

▶ HW3: Grades released on Gradescope
▶ HW4: due today (Apr 14)
▶ HW5: will be released today due May 1. Two optional questions
▶ Survey responses:
  ▶ Poor internet connectivity: made lectures downloadable, section recording will be more reliable
  ▶ OH: will make slight adjustments
  ▶ Have reached out individuals; get in touch if you’d like to chat
▶ Feedback is always welcome!!!! Email or post on Piazza...
  ▶ If you have any issues that are affecting your ability to learn/succeed in CS152 or other courses, please let us know!
Today, we will learn about

- Dependent types
  - Motivation: reasoning precisely about vectors
  - LF type system
Dependent types: motivation
First attempt at type system
Issues
LF (Logical Framework)
Judgment for Expressions: $\Gamma \vdash e : \tau$
Judgment for Types: $\Gamma \vdash \tau :: K$
Judgment for Kinds: $\Gamma \vdash K \text{ ok}$
Judgments for equivalence

See notes

- $\Gamma \vdash e_1 \equiv e_2 : \tau$
- $\Gamma \vdash \tau_1 \equiv \tau_2 :: K$
- $\Gamma \vdash K_1 \equiv K_2$
Back to vectors...