# **Mutable Variables**

CS 350

Dr. Joseph Eremondi

Last updated: August 1, 2024

# **Outline**

• Learning goals

- Learning goals
  - To interpret a language where variables can change values (mutate)

- Learning goals
  - To interpret a language where variables can change values (mutate)
  - To understand the design choices around functions in such a language

- Learning goals
  - To interpret a language where variables can change values (mutate)
  - To understand the design choices around functions in such a language
- Key concepts

- Learning goals
  - To interpret a language where variables can change values (mutate)
  - To understand the design choices around functions in such a language
- Key concepts
  - o Pass-by-reference vs. Pass-by-value

• Until now, a variable denoted a value

- Until now, a variable denoted a value
  - o In a given environment

- Until now, a variable denoted a value
  - o In a given environment
- They didn't really ever vary

- Until now, a variable denoted a value
  - In a given environment
- They didn't really ever vary
  - Except between different function calls

- Until now, a variable denoted a value
  - o In a given environment
- They didn't really ever vary
  - Except between different function calls
- To allow variables values to change, we can make one simple change:

- Until now, a variable denoted a value
  - In a given environment
- They didn't really ever vary
  - Except between different function calls
- To allow variables values to change, we can make one simple change:
  - Keep locations instead of values in the environment

- Until now, a variable denoted a value
  - o In a given environment
- They didn't really ever vary
  - Except between different function calls
- To allow variables values to change, we can make one simple change:
  - Keep locations instead of values in the environment
  - Then each variable refers to a single store location, whose value can change

# Pass-by-value

# **Pass-by-reference**