

# Midterm I Review

CS 115 | Saelee



# Agenda

1. Exam mechanics & coverage
2. Grading policy (aftermath)
3. Path forward

# 1. Exam Coverage

- Arithmetic of numbers, booleans, strings, and images
- Variables
- Functions: usage, composition, definition
- Special forms: `define` and `if`



# Numerical Arithmetic

- Translation of infix  $\leftrightarrow$  prefix forms
- Exact vs. Inexact numbers
- Order of precedence?
- Basic operators + mathematical functions  
(e.g., sqrt, expt, numerator, denominator)



# Boolean Arithmetic

- Generating functions:
  - Relational operators (e.g.,  $=$ ,  $<$ ,  $>$ ,  $\leq$ ,  $\text{string}=?$ )
  - Predicates (e.g.,  $\text{string}?$ ,  $\text{image}?$ )
- Essential operations: **and**, **or**, **not**



# Arithmetic of Strings

- Representation (e.g., "hello")
- String functions:
  - string-append
  - string-length
  - string-ith



# Arithmetic of Images

- Image generating functions (e.g., circle)
- Image querying functions (e.g., image-length)
- Image manipulation functions (e.g., overlay, above, below, etc.)
- No need to memorize functions, but given description should be able to use them!

# Variables

- Definition and Usage
- Vocab: “binding”



# Functions

- Application and Composition
  - application = applying function to inputs
  - composition = “stacking” functions on top of each other
- Definition and corresponding Usage

# Function Definitions

- Vocab: “arity” — # of inputs
- Local variables

# Conditional “if” form

- Standalone `if` form
  - Understand as expression!
- Nested `if` expressions

## 2. Grading policy

- First midterm = growing pains
- If you blow a midterm, you can still do well
- Any better subsequent exam score will count for itself *and* replace the worse score
  - So if you score 100% on final, you get 100% on all exams



# 3. Path forward

- See updated schedule
- After exam:
  - Design recipe (and testing)
  - Animation
  - “Batch” and “Universe” programs