CSE 341 Final Prep

PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING
(Rough) Final Topics

• **Static vs Dynamic Typing**
  • Static types are computed at compile time
  • Dynamic types are computed at runtime
  • Type systems

• **Type System **Soundness vs. Completeness**
  • Soundness: Reject bad programs
  • Completeness: Accept all good programs

• **Subtyping:**
  • Width (more fields; okay) vs. Depth (subtyping within fields; not sound given mutability), also Permutation, Transitivity and Reflexivity
  • Function subtyping:
    • Arguments can provide more, callers give more→ **Contravariant**
    • Results can guarantee more, callers assume less → **Covariant**

• **Mutability**
  • SML → ref; Racket → set!/set-mcar!/…; Ruby → everything

• **Ruby** (e.g. Mixins, Arrays/Blocks, Inheritance, ….)
• **Racket** (e.g. list manipulation, streams, ….)
• **SML** (e.g. structs/signatures, pattern matching, polymorphism, ….)
• **Interpreters** (MUPL)
Practice Question Types

• Subtyping
• Soundness/Completeness
• Static vs Dynamic Typing
• Racket Programming
• Streams
• Interpreters/MUPL