CS 603: Programming Language Organization

Lecture 5

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Department of Computer Science

University of Alabama

Joel Jones

Outline

- Questions
- Impcore Interpreter
- Reading for next time

Example Use of Operational Semantics

- Review from last time

```
(define myAdd1 (n) (+ 1 n))
```

-
```
(set i (+ (myAdd1 j) 5))
```

Pair Up: • Write the judgments for the top-level above

Original Forms
```
(define myAdd1 (n) (+ 1 n))
(set i (+ (myAdd1 j) 5))
```

AST Forms
(<n>, APPLY(+, LITERAL(1), VAR(n)))
SET(i, APPLY(+, APPLY(myAdd1, VAR(j)), LITERAL(5))

EVALEXP	Converts top-level into an expression
ASSIGNGLOBAL	Matches SET and i $\notin \rho$, to finish, must evaluate *e*
APPLYADD	Matches +, to finish, must evaluate e_1 and e_2
APPLYUSER	e_1 from **APPLYADD**, myAdd1 $\in \xi$ with myAdd1 $\mapsto$ (<n>, APPLY(+...)), to finish, must evaluate e_1 through e_n, then body
GLOBALVAR	e_1 from **APPLYUSER**, j $\in \xi$ with j $\mapsto$ 2 (for example)
APPLYUSER	done with argument evaluation, build ρ={n $\mapsto$ j} and evaluate body
APPLYADD	Matches +, to finish, must evaluate e_1 and e_2
LITERAL	e_1 from **APPLYADD**, evaluates to 1
FORMALVAR	e_1 from **APPLYADD**, n $\in \rho$, environment lookup returns 2
LITERAL	e_2 from first **APPLYADD**, evaluates to 5