Meeting 11: Data types and Polymorphism

Today
Visitors
what are P1 programs?

Growing the language

Data types
- list
- dictionaries
- if expressions
- boolean
- (boolean operators)

add/sub
integer
input
print
assignment
Visitors

Paul: A generic tree walk

Library

User -> what to do as you walk the tree

AST - trees

"All we do is walk trees."
- New data types: Boolean, list, dictionaries

Abstract Syntax: given Fig 1

Semantics / Meaning / How Programs Execute: Given Python interpreter
$P_0$ - integers

Therefore, every syntactically correct $P_0$ program had "well-defined" semantics.

$P_1$ - new data types

Type errors! [1 or 2]
Updating your compiler for $P_1$

$P_0 \rightarrow \text{Parse} \rightarrow \text{AST}$

$x86$ $\rightarrow \text{Print}$ $\rightarrow \text{Instr Alloc}$ $\rightarrow \text{Instr Select}$
Pl AST

restrict and/or \( \land \lor \equiv \equiv \) to binary

P1 Flatten

print input(\( ) + 1 \) if input(\( ) \) else E1, input(\( )

expr

expr

expr

expr
IR needs => if statement

print input(0) + 1 if input(0) else [1, input(0)]

Only should read twice

Changed the semantics

tmp1 = input(0)
if tmp1 ≥
    tmp2 = input(0)
    tmp3 = tmp2 + 1
    tmp4 = input(0)
    tmp5 = [1, tmp4]
else
    tmp0 = tmp3 if tmp1 else tmp5
print tmp0

flattered