Meeting 18: HW5

Today

Your Questions

Explain code from HW4

Go over Quiz 4

Midterm Next Thu
7:45 pm - 9:45 pm
ECCR 1B40

Parts of Reference
Compiler Released

Heapify Algorithm will create closure

\[
f = \lambda x, y: \quad \text{return } x + y
\]

Bob

\[
x = z
\]

print f(40)

Decide which vars need heapification

1. Find where vars are

\[
\text{heaptied} : \text{AST} \rightarrow \text{Set of vars to heapify}
\]

2. Do the transformation

\[
\text{heaptied} : \text{AST} \times \text{Dict} \rightarrow \text{AST}
\]

Step 1

\[
x = [0]
\]

\[
f = \lambda x, y: \quad \text{return } x[0] + y
\]

\[
x[0] = 2
\]

print f(40)

Later phases for functions

\[
x = 0
\]

\[
f = \lambda x, y: \quad \text{return } x + y
\]

\[
x[0] = 2
\]

\[
\text{print } f(40)
\]

Step 1

Call Have: get frees vars

\[
\text{helpers}
\]

Locals for each scope

\[
lambda x: \text{return } x
\]
\[ x = 5 \]
\[ f = \text{lambda} : \]
\[ y = 3 \]
\[ g = \text{lambda} z : y + x \]

\[ \text{FV}(\text{let } x = [e_1] \text{ in } e_2) \]
\[ \Rightarrow \text{FV}(e_1) \cup \text{FV}(e_2) - 3 \times 3 \]

\[ x = [e_1] \]
\[ x[y] = 5 \]
\[ f = \text{lambda} : \]
\[ y = [e_1] \]
\[ y[z] = 3 \]
\[ g = \text{lambda} z : y[z] + x[e_1] \]

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**Function Layout**

\[ f (p_1, p_2, p_3) : \]
\[ l_1 = \]
\[ l_2 = \]
\[ l_3 = \]

\[ \text{movl} 8(\%ebp), p_1 \]
\[ \vdots \]