

MIDTERM REMINDER

FRIDAY NOV 14TH 5:30-7:30
1221 COMP SCI

COVERS THROUGH "POINTS TO" ANALYSIS

PROJ #4 GRAPH COLORING REGISTER ALLOCATION
"MACHINEFUNCTION" PASS

START-UP SKELETON IN `~cst01-1/public/proj4/skeleton`

VREGS \cap PREGS (BOTH APPEAR IN INTERFERENCE GRAPH)

NO SPILLING REQUIRED

STEPS:

GIVEN \rightarrow 1. FOR EACH REG CLASS, GET POSSIBLE PHYSICAL REGS

GIVEN \rightarrow 2. DO REACHING DEFS AND LIVEVAR ANALYSES

3. COMPUTE LIVE RANGES

4. BUILD INTERFERENCE GRAPH

LIVE RANGE INTERFERE IF

OVERLAP IN CFG NODES

AND

AVAIL REGS AND ALIASES ARE NON-DISJOINT

5. COLOR THE INTERFERENCE GRAPH

(a) PUSH "EASY NODES"

DON'T DOUBLE COUNT NEIGHBORS w/ SAME COLOR

(b) THEN PUSH A NODE w/ MAX NEIGHBORS
(NO SPILL COST USED)

(c) POP NODES

PREG ONLY ONE CHOICE

GET COLOR NOT ALREADY USED BY NEIGHBORS

NO SPILLING NEEDED IN ASG

(JUST ERROR MSG)

6. IN LLVM INST, REPLACE VREG w/ PREG (SELECTED COLOR)

IF CALL IS IN LIVE RANGE (. . . ISCALL())

ALLOCATE STACK SPACE (ONCE PER LIVE RANGE)

STORE REG BEFORE EACH CALL

RELOAD REG AFTER EACH CALL

----- EXTRA CREDIT ----- (SPILLING)

FIND 3 PHYSICAL REGS PER REG CLASS

GET STACK SPACE FOR SPILL

GET SPILL REG

FOR USE, LOAD FROM STACK INTO SPILL REG

FOR DEF, STORE SPILL REG INTO STACK

REPLACE VREG WITH SPILL REG IN INST

DEBUGGING FLAGS

PRINTLIVE } GIVEN TO YOU
PRINTRD }

PRINTRANGES

PRINTGRAPH

