Lab 5

CMPUT 229

University of Alberta

Outline

Lab BasicBlock: The Main Idea

- Compute leaders (use your Lab_Offsets solution).
- Compute the basic blocks corresponding to the leaders.
- Compute the Control Flow Graph for the procedure.
- Compute the Dominator Set for each basic block.
- Allocate memory for:
  - Basic block list
  - Control Flow Graph list
  - Dominator set list
- Adjust stack pointer and put addresses in correct places

Lab_BasicBlock: Compute Leaders

- The two main options for storing the leaders are:
  - A list of instruction addresses, where each element is the address of a leader;
  - A binary vector where each bit corresponds to an instruction in the program. Bits equal 1 in this vector signal leaders.

Lab_BasicBlock: Bit Vector

- The best strategy is to implement the binary vector as a separate set of subroutines.
  - It will be simpler to call a subroutine to set a bit, reset a bit, to AND two vectors, or to OR two vectors.
  - Even if the subroutine calls make the implementation sligthly less efficient, it will be worth the lower complexity of the code and lower chance of errors.
- The CMPUT 229 midterm in Fall 2012 had a question that consisted on the implementation of some of the typical functions to manipulate an arbitrary lenght bit vector.

Lab_BasicBlocks: Tips

- The specification states that the value of `$sp` is changed by `getControlFlow`
- The order of the basic blocks in the list matters.
- The order of the Control Flow Graph edges in the list also matters.
- Produce and submit test cases early. Everyone will benefit.
- Code is provided for you to "pretty print" your solutions and compare with test cases.
- Do not wait until the last week to start working on this lab.

Lab 5 Questions?