QtSpim Example

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CompOrg

Copy from one array to another

- Write a MIPS program that copies all the elements from array A starting from position ***i*** into array B starting from position ***j***. Assume that array A has ***f*** elements and array B has ***g*** elements. Your program must check for the array-out-of-bound conditions.
- Assume the following:
  - The base addresses of arrays ***A*** and ***B*** are stored in registers ***$s0*** and ***$s1***, respectively.
  - The variables ***i***, ***j, f,*** and ***g*** are stored in registers ***$s2, $s3, $s4,*** and ***$s5***, respectively

What we have

- **startA = $s2**
- **startB = $s3**
- **sizeA = $s4**
- **sizeB = $s5**
- **A = $s0**
- **B = $s1**

- **We will use $s6 and $s7 for the current address in A and B respectively**

Start

- # initialize array counters get address of A[startA] and B[startB]
- sll $s6, $s2, 2 # startA*4
- add $s6, $s6, $s0 # address A[startA]
- sll $s7, $s7, 2 # startB*4
- add $s7, $s7, $s1 # address A[startB]

- DO NOT OVERWITE $s0 and $s1
  - You could actually do it here with no harm, but we will keep it intact to monitor the progress through the loop

Just giving you a preview of the loop context

- **loop:** # while (startA < sizeA && startB < sizeB)
  - #Loop through A
  - slt $t0, $s2, $s4 # $t0 <-1 if (startA < sizeA), $t0 <-0 if (startA >= sizeA)
  - beq $t0, $zero, end
  - #loop through B
  - slt $t0, $s3, $s5 # $t0 <-1 if (startB < sizeB), $t0 <-0 if (startB >= sizeB)
  - beq $t0, $zero, end

Body of the loop

- lw $a0, 0($s6) # get/copy A[startA] into $a0
- sw $a0, 0($s7) # B[startB] = A[startA]

- #adjust the index address
- addi $s7, $s7, 4 # addr(B[startB]) +=4
- addi $s6, $s6, 4 # addr(A[startA]) +=4
- Adjust the position, so you can test if you reached the end of any array
- addi $s3, $s3, 1 # startB++
- addi $s2, $s2, 1 # startA++
- j **loop**
- # end of the program