EFREI CA2023F

Computer Architecture Lab 6

# Counter control loop

How to implement counter controlled loop in assembly:

for (loopcntr = startVal; loopcntr < endVal; loopcntr+=incVal)

{

; loop body

}

There is a simple code example that implements this type of loop

**.data**

**loopcntr: .long 0**

**startVal: .long 10**

**endVal: .long 20**

**incVal: .long 2**

**.text**

**.global \_main**

**\_main:**

**# standard program prologue**

**pushl %ebp**

**movl %esp, %ebp #for correct debugging**

**# initialize the loop**

**movl startVal, %ecx # start value of the loop counter into %ecx**

**movl %ecx, loopcntr # store loop counter**

**cntrloop:**

**# loop condition**

**movl loopcntr,%ecx #restore loop couter in %ecx**

**cmpl %ecx, endVal**

**jle end\_loop**

**#loop body**

**xorl %ecx,%ecx # we may even destroy content of %ecx**

**# loop body end**

**# increase loopcntr by value of incVal and run loop again**

**addl incVal, %ecx**

**movl %ecx,loopcntr # uptade loop couter value**

**jmp cntrloop # execute loop again**

**# finish the loop**

**end\_loop:**

**# standard program epilogue**

**popl %ebp**

**xorl %eax, %eax**

**ret**

Assignment: Write a program that calculate sum of natural numbers form given range.

# C Calling convention

Read this document:

https://aaronbloomfield.github.io/pdr/book/x86-32bit-ccc-chapter.pdf