**CSCI 360 BCT and BCTR Branching Instructions**

**Branch on Count**

* RX Format: label BCT R,D(X,B)  
  + Decrements the value in R by 1 and branches to D(X,B) if the value in R is not 0
  + If R contains 0, instruction immediately following BCT is execute

**Branch on Count Register**

* RR Format: label BCTR R1,R2
  + Decrements the value in R1 by 1 and branches to the address in R2 if the value in R1 is not 0
  + If R1 contains 0, instruction immediately following BCTR is executed
  + **EXCEPTION**: If R2 is register 0, then 1 is subtracted from the value in R1 and NO branch is taken

**Three Versions Looping Examples with Same Result**

LA R4,3 LA R4,3 LA R4,3

DO1 LTR R4,R4 DO1 LTR R4,R4 DO1 XREAD BUFFER,80

BZ ENDDO1 BZ ENDDO1 XPRNT BUFFER,80

XREAD BUFFER,80 XREAD BUFFER,80 BCT R4,DO1

XPRNT BUFFER,80 XPRNT BUFFER,80 EXIT BR R14

S R4,=F‘1’ BCTR R4,R0

B DO1 B DO1

ENDDO1 DS 0H ENDDO1 DS 0H

EXIT BR R14 EXIT BR R14