CS 2461 Lab- Week 10

Today....

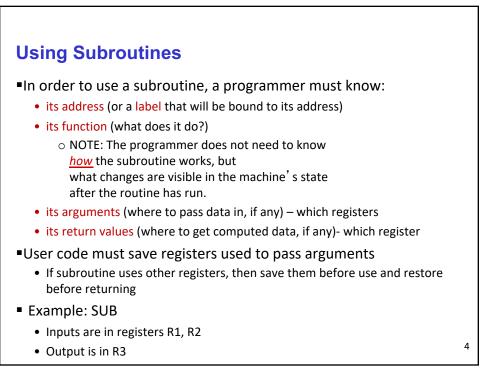
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- More assembly using Subroutines
- Homework 4 and Project 4 ...write out your flowchart



- TRAP routines
 - System calls to process I/O (or other system tasks)
 - Written by system, called by user
 - \circ Resides as part of system code
 - Steps: Call, Process, Return
- Subroutines i.e., functions
 - Written by user
 - Called by user program using JSR or JSRR instruction
 - Returns to calling program (callee) using RET instruction
 - Steps: Call, Process, Return







- need to be able to call and return from SUB subroutine
- inputs are in R1,R2 and Output is in R3= R2 R1

give label to first line in the code...this is address of subroutine SUB...To call, the user program needs to set PC to this address

SUB NOT R0, R1 ; complement R1 and add 1 to get
ADD R0, R0, #1 ; 2's complement R2 = -R1
ADD R3, R0, R2 ; R3= R0+R2 = R2 - R1
RET ; replace HALT by RET to return to caller

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Using SUB from 'main' main code: subtract two numbers in memory and write back difference. • Read two numbers from memory locations number1, number2 and store into registers R1, R2. • Call SUB and store result in memory location result .ORIG x3000 LD R0, number1 LD R1, number2 JSR SUB ; call SUB (JSRR if SUB not within 2^10) ST R3, result; store result returned in R3 into memory HALT Number1 .FILL x000A .FILL #8 Number2 Result .BLKW #1 ;reserve space for result If R2 is used in main then need to save them into memory 6

