

Class: CIS11 (22953)

Assignment: Project

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Date: 2024-06-06

The image shows a screenshot of the LC3 Simulator and Console. The main window displays the assembly code for a program named 'FINALv02-JTeam.asm'. The code includes a subroutine to restart the program, a main loop that gets user input and checks if it's 'y' or 'Y' to restart, and a section for data storage for subroutines. The console window shows the program's output, including the prompt 'Enter 5 test scores: 'scores can range from 0 to 99', the input '52 F', '87 B', '96 A', '79 C', '61 D', and the calculated scores: Maximum Score: 96, Minimum Score: 52, Average Score: 75. The program also prompts the user to run again, and the user inputs 'N'.

```
; Subroutine to restart the program
RESTART_PROG
    RETADDRESS1 .FILL X0
    LD R1, V_LOW ; Load the ASCII value of lowercase 'y'
    LD R3, V_UP   ; Load the ASCII value of uppercase 'Y'
    LD R2, ADD_RESTART ; Load the address to jump to for restarting the program
    LD R0, LINER
    OUT
    LEA R0, RESTART_PROG_STR ; Load address of the prompt message
    PUTS
    LEA R0, RESTART_PROG_STR2 ; Print the prompt message
    PUTS
    LD R0, LINER
    OUT
    GETC
    ADD R1, R1, R0 ; Compare the input with lowercase 'y'
    BRZ RESTART_TRUE ; If the input is 'y', restart the program
    ADD R3, R3, R0 ; Compare the input with uppercase 'Y'
    BRZ RESTART_TRUE ; If the input is 'Y', restart the program
    HALT ; If the input is neither 'y' nor 'Y', halt the program
RESTART_TRUE
    JMP R2 ; Jump to the address for restarting the program
RESTART_PROG_STR .STRINGZ "The results are displayed above. Would you like to run this program again?\n"
RESTART_PROG_STR2 .STRINGZ "If Yes press Y. If No press N."
V_LOW .FILL xFF87 ; ASCII value of lowercase 'y'
V_UP .FILL xFFA7 ; ASCII value of uppercase 'Y'
ADD_RESTART .FILL x3000 ; Address to jump to for restarting the program

; Data storage for subroutines
READDRESS1 .FILL X0 ; Storage for saving return address
READDRESS2 .FILL X0 ; Storage for saving return address
REGVAL1 .FILL X0 ; Storage for saving register values
REGVAL2 .FILL X0 ; Storage for saving register values
REGVAL3 .FILL X0 ; Storage for saving register values

; Subroutine to get user input for a test score
CONVERT_INPUT ST R7, READDRESS1 ; Save the return address
JSR EMPTY_R ; Call subroutine to clear registers R1-R6
LD R4, DECODER1 ; Load the value for decoding ASCII digits
GETC
JSR DATA_VALID ; Call subroutine to validate the input
OUT
ADD R1, R0, R0 ; Echo the input
ADD R1, R1, R4 ; Move the input to R1
ADD R1, R1, R4 ; Convert the ASCII digit to its numeric value
J
```

Assembling C:\Users\teamm\Desktop\bowie-lc3\Files\FINALv02-JTeam.asm...
Starting Pass 1...
Pass 1 - 0 error[s]
Starting Pass 2...
Pass 2 - 0 error[s]

LC3 Console

Enter 5 test scores: 'scores can range from 0 to 99
52 F
87 B
96 A
79 C
61 D
Maximum Score: 96
Minimum Score: 52
Average Score: 75
The results are displayed above. Would you like to run this program again?
If Yes press Y. If No press N.

Memory

Manage Labels

	0x	Label	Hex	Instruction
<input type="checkbox"/>	xFD75		xA22F	LDI R1, xFDA5
<input type="checkbox"/>	xFD76		x202F	LD R0, xFDA6
<input type="checkbox"/>	xFD77		x5040	AND R0, R1, R0
<input type="checkbox"/>	xFD78		x802C	STI R0, xFDA5
<input checked="" type="checkbox"/>	xFD79		x2003	LD R0, xFD7D
<input type="checkbox"/>	xFD7A		x2203	LD R1, xFD7E
<input type="checkbox"/>	xFD7B		x2E03	LD R7, xFD7F
<input type="checkbox"/>	xFD7C		xC1C0	RET
<input type="checkbox"/>	xFD7D		x006E	NOP
<input type="checkbox"/>	xFD7E		xFFF5	.FILL xFFF5
<input type="checkbox"/>	xFD7F		x3101	ST R0, xFC81
<input type="checkbox"/>	xFD80		x000A	NOP
<input type="checkbox"/>	xFD81		x002D	NOP
<input type="checkbox"/>	xFD82		x002D	NOP
<input type="checkbox"/>	xFD83		x002D	NOP
<input type="checkbox"/>	xFD84		x002D	NOP

Status

Registers

R0: x7FFF
R4: x0005
PC: xFD79

R1: xFFFF
R5: x0030
IR: x802C

R2: x3000
R6: xFFFFB
PSR: x8001

R3: x0015
R7: xFD75
CC: P

☒ Follow PC

Console

Enter 5 test scores: *scores can range from 0 to 99

52 F
87 B
96 A
79 C
61 D
Maximum Score: 96
Minimum Score: 52
Average Score: 75
The results are displayed above. Would you like to run this program again?
If Yes press Y. If No press N.

----- Halting the processor -----

☒ Newline as 0x0A
☐ Newline as 0x0D
☐ Binary (leave newlines unchanged)