Lab 4 Report

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Registered Lab Session: 3A
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EECS 20

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Code for Lab 4

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        .ORIG x2000
SOP     AND R0, R0, #0
        LEA R0, ITO
        TRAP x22
ITO     .STRINGZ "\nEnter the most significant digit of number:\n"
        AND R1, R1, #0          ; GETS MOST SIGNIFICANT NUMBER
        AND R0, R0, #0
        TRAP x20

        ADD R1, R1, #15         ; -48
        ADD R1, R1, #15
        ADD R1, R1, #15
        ADD R1, R1, #3
        NOT R1, R1
        ADD R1, R1, #1

        ADD R1, R1, R0
        AND R0, R0, #0
        LEA R0, IT1
        TRAP x22
IT1     .STRINGZ "Enter the least significant digit of number:\n"
        AND R2, R2, #0          ; GETS LEAST SIGNIFICANT NUMBER
        AND R0, R0, #0
        TRAP x20
        ADD R2, R2, #15         ; -48
        ADD R2, R2, #15
        ADD R2, R2, #15
        ADD R2, R2, #3
        NOT R2, R2
        ADD R2, R2, #1

        ADD R2, R2, R0

        AND R3, R3, #0          ; CLEARS REGISTERS
        AND R4, R4, #0
        AND R5, R5, #0
        AND R6, R6, #0
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        ADD R3, R3, 10          ; MAKES THE MOST SIGNIFICANT BIT INTO
ACTUAL NUMBER I.E. 30 THEN ADDS LEAST SIG FIG NUMBER
    J1  ADD R4, R1, R4
        ADD R3, R3, #-1
        BRp J1
        ADD R5, R4, R2          ; COMBINES BOTH NUMBERS

        ADD R6, R5, R6          ; CHECKS IF 0
        BRz EOP
        AND R0, R0, #0          ; PRINTS THE FACTORAL MESSAGE WITH
NUMBERS
        LEA R0, ROE
        TRAP x22
    ROE .STRINGZ "The integer factors for "

        AND R0, R0, #0          ; ADDS 48 AND PRINTS MOST SIG NUMBER
        ADD R1, R1, #15         ; 48
        ADD R1, R1, #15
        ADD R1, R1, #15
        ADD R1, R1, #3

        ADD R0, R1, #0
        TRAP x21
        AND R0, R0, #0          ; ADDS 48 AND PRINTS LEAST SIG NUMBER
        ADD R2, R2, #15         ; 48
        ADD R2, R2, #15
        ADD R2, R2, #15
        ADD R2, R2, #3
        ADD R0, R2, #0
        TRAP x21
        AND R0, R0, #0          ; PRINTS THE FACTORIAL MESSAGE WITH
NUMBERS
        LEA R0, ROF
        TRAP x22
    ROF .STRINGZ " are:\n"

        AND R1, R1, #0          ; TRANSFERS VALUE FROM R5 TO R1
        ADD R1, R5, #0
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```
        AND R5, R5, #0

LLL2    AND R0, R0, #0          ; CLEARS ALL REGISTERS FOR 2 FACTOR
        AND R2, R2, #0
        AND R3, R3, #0
        AND R4, R4, #0
        AND R5, R5, #0

LL2     ADD R1, R1, #-2         ; DIVISION FOR 2 FACTOR
        BRn LLL3            ; BRANCH TO 3 FACTOR
        ADD R2, R2, #1
        AND R3, R3, #0
        ADD R3, R1, #0
        BRz L2                  ; PRINT 2 FACTOR
        AND R3, R3, #0
        ADD R3, R1, #0
        BRp LL2

L2      AND R1, R1, #0
        ADD R1, R2, #0
        AND R2, R2, #0
        ADD R0, R0, #15         ; PRINTS 2
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #5
        TRAP x21
        AND R0, R0, #0          ; PRINTS SPACE
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #2
        TRAP x21
        BRnzp LLL2

LLL3    AND R0, R0, #0          ; CLEARS ALL REGISTERS FOR 3 FACTOR
        AND R2, R2, #0
        AND R3, R3, #0
        AND R4, R4, #0
        AND R5, R5, #0
        AND R6, R6, #0
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```
LL3     ADD R1, R1, #-3         ; DIVISION FOR 3
        BRn LLL5            ; JUMP TO 5
        ADD R2, R2, #1
        AND R3, R3, #0
        ADD R3, R1, #0
        BRz L3                  ; PRINT 3
        AND R3, R3, #0
        ADD R3, R1, #0
        BRp LL3

L3      AND R1, R1, #0          ; PRINT 3
        ADD R1, R2, #0
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #6
        TRAP x21
        AND R0, R0, #0          ; PRINT SPACE
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #2
        TRAP x21
        BRnzp LLL3

LL7     ADD R1, R1, #-7         ; DIVISION FOR 7
        BRn SOP
        ADD R2, R2, #1
        AND R3, R3, #0
        ADD R3, R1, #0
        BRz L7                  ; PRINTS 7
        AND R3, R3, #0
        ADD R3, R1, #0
        BRp LL7

LLL5    AND R0, R0, #0          ; CLEARS ALL REGISTERS FOR 5 FACTOR
        AND R2, R2, #0
        AND R3, R3, #0
        AND R4, R4, #0
```

```
        AND R5, R5, #0
        AND R6, R6, #0

LL5     ADD R1, R1, #-5         ; DIVISION 5
        BRn LL7                 ; GOES TO 7
        ADD R2, R2, #1
        AND R3, R3, #0
        ADD R3, R1, #0
        BRz L5
        AND R3, R3, #0
        ADD R3, R1, #0
        BRp LL5

L5      AND R1, R1, #0          ; PRINTS 5
        ADD R1, R2, #0
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #8
        TRAP x21
        AND R0, R0, #0          ; PRINTS SPACE
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #2
        TRAP x21
        BRnzp LLL5

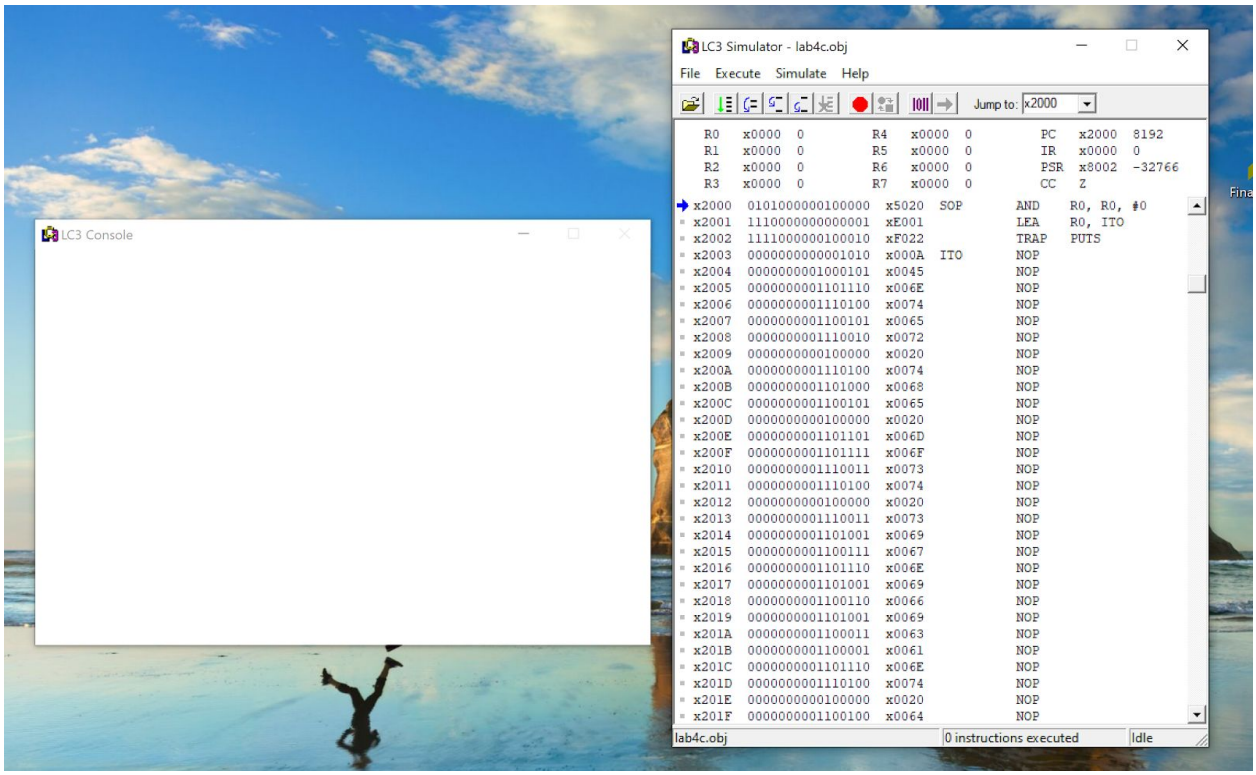
LLL7    AND R0, R0, #0          ; CLEARS ALL REGISTERS FOR 7 FACTOR
        AND R2, R2, #0
        AND R3, R3, #0
        AND R4, R4, #0
        AND R5, R5, #0
        AND R6, R6, #0


L7      AND R1, R1, #0
        ADD R1, R2, #0
        ADD R0, R0, #15
        ADD R0, R0, #15
```

```
        ADD R0, R0, #15
        ADD R0, R0, #10
        TRAP x21
        AND R0, R0, #0
        ADD R0, R0, #15
        ADD R0, R0, #15
        ADD R0, R0, #2
        TRAP x21
        BRnzp LLL7


EOP     AND R0, R0, #0              ; ENDS THE PROGRAM
        LEA R0, IT2
        TRAP x22
        TRAP x25
IT2     .STRINGZ "\nGoodbye Adrian"
        .END
```

Screenshot for BEFORE



Screenshot for AFTER