

```
LC3 Console
Name: Yongye Zhu
EID: yz24493
Date: 12/06/2018
Title: ID Card Data Parser

helloworldimcode
Access Denied!

16100
Access Granted!

ireadstring16105
Access Granted!

1615016110
Access Granted!

1111116115
Access Granted!

finishedtesting
Access Denied!

=)
```

```
LC3Edit - isr.asm
File Edit Translate Help

; Title: ID Card Data Parser - ISR
; Name: Yongye Zhu
; EID: yz24493
; Date: 12/06/2018
; Recitation Section: Friday 9-10
; Description of program: Reads a character from console
; and increments character count
; Keyboard ISR runs when a key is struck

.ORIG x8000
    ST      R0, SAUER0
    LDI     R0, KBDR
    STI     R0, ST_C    ;store what is in KBDR into x8000

    LDI     R0, COUNT
    ADD     R0, R0, #1
    STI     R0, COUNT    ;increment the counter

    LD      R0, SAUER0    ;restore the value

    RTI
SAUER0 .BLKW 1
ST_C .FILL x8000
COUNT .FILL x8001
KBDR .FILL xFE02
.END
```

LC3Edit - yz24493Lab5.asm

File Edit Translate Help

Ready

Line 1

```
; Title: ID Card Data Parser - Main Program
; Name: Yongye Zhu
; EID: yz24493
; Date: 12/06/2018
; Recitation Section: Friday 9-10
; Description of program: ID Card Parser

.ORIG x3000
; set up ISR
LD R6, SP ;load the supervisor stack pointer
LD R1, KBISR
STI R1, KBISRU ;initialize ISR to ISRU
LD R1, ENINT
STI R1, KBSR ;enable KBI
AND R2, R2, #0 ;used to clear x8000

; start of actual program
; Implementation of finite state machine
; STATE 0: continuously check x8000 see if the data is "1"
; Register Usage:
; R0: read character from x8000, and echo to the console
; R1: load the negative value used to compare, and store the comparison
; R2: used to clear x8000 after usage
; R3: load the value from counter to see if exceed the limit

LEA R0, NAME
PUTS
LEA R0, EID
PUTS
LEA R0, DATE
PUTS
LEA R0, TITLE
PUTS
LEA R0, ETR
PUTS
```

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Ready

Line 1

```
STATE0 LDI R0, ST_C
BRZ STATE0
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE1
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRZ DENIED
BR STATE0

STATE1 LDI R0, ST_C
BRZ STATE1
OUT
STI R2, ST_C
LD R1, NH_SIX
ADD R1, R1, R0
BRZ STATE2
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE1
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRP DENIED
BR STATE0

STATE2 LDI R0, ST_C
BRZ STATE2
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE3
LDI R3, COUNTER
```

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LDI R0, ST_C
BRZ STATE2
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE3
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRP DENIED
BR STATE0

STATE3 LDI R0, ST_C
BRZ STATE3
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE4A
LD R1, NH_ZERO
ADD R1, R1, R0
BRZ STATE4B
LD R1, NH_SIX
ADD R1, R1, R0
BRZ STATE2
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRP DENIED
BR STATE0

STATE4A LDI R0, ST_C
BRZ STATE4A
OUT
STI R2, ST_C
LD R1, NH_ONE

Ready

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Line 1

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LDI R0, ST_C
BRZ STATE4A
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE1
LD R1, NH_ZERO
ADD R1, R1, R0
BRZ STATE5
LD R1, NH_FIVE
ADD R1, R1, R0
BRZ STATE5
LD R1, NH_SIX
ADD R1, R1, R0
BRZ STATE2
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRP DENIED
BR STATE0

STATE4B LDI R0, ST_C
BRZ STATE4B
OUT
STI R2, ST_C
LD R1, NH_ONE
ADD R1, R1, R0
BRZ STATE1
LD R1, NH_ZERO
ADD R1, R1, R0
BRZ STATE5
LD R1, NH_FIVE
ADD R1, R1, R0
BRZ STATE5
LDI R3, COUNTER
LD R1, NH16

Ready

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Line 1

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STATE4B

LDI

R0, ST_C

BRZ

STATE4B

OUT

STI

R2, ST_C

LD

R1, NH_ONE

ADD

R1, R1, R0

BRZ

STATE1

LD

R1, NH_ZERO

ADD

R1, R1, R0

BRZ

STATE5

LD

R1, NH_FIVE

ADD

R1, R1, R0

BRZ

STATE5

LDI

R3, COUNTER

LD

R1, NH16

ADD

R1, R1, R3

BRP

DENIED

BR

STATE0

STATE5

LEA

R0, IN_MSG

PUTS

LEA

R0, ETR

PUTS

STORE

LDI

R0, ST_C

BRZ

#-2

STI

R2, ST_C

LDI

R3, COUNTER

LD

R1, NH16

Ready

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Line 1

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12/10/2018

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File Edit Translate Help

STORE LDI R0, ST_C
BRZ #2
STI R2, ST_C
LDI R3, COUNTER
LD R1, NH16
ADD R1, R1, R3
BRNP STORE
STI R2, COUNTER
BR STATE0

DENIED LEA R0, OUT_MSG
PUTS
STI R2, COUNTER
LEA R0, ETR
PUTS
BR STATE0

HALT

NH_ZERO .FILL xFFD0
NH_ONE .FILL xFFCF
NH_FIVE .FILL xFFCB
NH_SIX .FILL xFFCA
NH16 .FILL xFFF0
ETR .STRINGZ ""
IN_MSG .STRINGZ "\nAccess Granted!\n"
OUT_MSG .STRINGZ "\nAccess Denied!\n"
ST_C .FILL x8000
COUNTER .FILL x8001

LC3Edit - yz24493Lab5.asm

File Edit Translate Help

LEA R0, ETR
PUTS
BR STATE0

HALT

NH_ZERO .FILL xFFD0
NH_ONE .FILL xFFCF
NH_FIVE .FILL xFFCB
NH_SIX .FILL xFFCA
NH16 .FILL xFFF0
ETR .STRINGZ ""
IN_MSG .STRINGZ "\nAccess Granted!\n"
OUT_MSG .STRINGZ "\nAccess Denied!\n"
ST_C .FILL x8000
COUNTER .FILL x8001
SP .FILL xF000
KBISR .FILL xA000
KBISRU .FILL x100
KBSR .FILL xFE00
ENINT .FILL x4000
NAME .STRINGZ "Name: Yongye Zhu\n"
EID .STRINGZ "EID: yz24493\n"
DATE .STRINGZ "Date: 12/06/2018\n"
TITLE .STRINGZ "Title: ID Card Data Parser\n"
STICKER .STRINGZ ":\n"
.END

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IDA 2.0

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16105	MW F	12:00 p.m.-1:30 p.m. 10:00 a.m.-11:00 a.m.	BUR 112 GEA 127	CUEVAS, A	closed		
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