Ahsanullah University of Science and Technology (AUST)
Department of Computer Science and Engineering

LAB REPORT

Course No   : CSE3108

Course Title   : Microprocessors Sessional

Assignment No   : 05

Date of Submission   : 12-02-2022

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Question:

Dot Matrix: `O A 5 H 4`

Seven Segment: 054

LED : RED1

Answer:

DSEG SEGMENT 'DATA'

DOT_MATRIX DB 10H, 7FH, 12H, 14H, 18H, 7FH, 08H, 08H, 08H,

7FH, 31H, 49H, 49H, 49H, 2FH, 7EH, 09H,

09H, 09H, 7EH, 3EH, 41H, 41H, 41H, 3EH

COUNTER DB 0

DSEG ENDS

SSEG SEGMENT STACK 'STACK'

DW 100 DUP(?)

SSEG ENDS

CSEG SEGMENT 'CODE'

START PROC FAR

PUSH DS

MOV AX, DSEG

MOV DS, AX

MOV ES, AX

```asm
        Mov CX, 0
        Mov DI, 0

DISPLAY:

        Mov DX, 2070H
        Mov AL, 00000001B
        out DX, AL

        Mov DX, 2001H
        Mov AL, 00000001B
        out DX, AL

        Mov DX, 2002H
        Mov AL, 00000001B
        out DX, AL

        Mov DX, 2003H
        Mov AL, 00000001B
        out DX, AL

        Mov DX, 2030H
        Mov AL, 00000001B
        out DX, AL

        Mov CX, 04FH
LO:     LOOP LO

        Mov DX, 2004H
        Mov AL, 00000010B
        out DX, AL

        Mov DX, 2004H
        Mov AL, 00000110B
        out DX, AL

        Mov DX, 2004H
        Mov AL, 00001110B
        out DX, AL

        Mov DX, 2004H
        Mov AL, 00011110B
        out DX, AL

        Mov DX, 2004H
        Mov AL, 00111110B
        out DX, AL

        Mov DX, 2030H
        Mov AL, 00000011B
        out DX, AL

        Mov DX, 2030H
        Mov AL, 00000111B
        out DX, AL

        Mov CX, 04FH
L1:     LOOP L1
```

```asm
Mov DX, 2003H
Mov AL, 01000001B
out DX, AL

Mov DX, 2002H
Mov AL, 01000001B
out DX, AL

Mov DX, 2001H
Mov AL, 01000001B
out DX, AL

Mov DX, 2030H
Mov AL, 00001111B
out DX, AL

Mov CX, 04FH
L2: Loop L2

Mov DX, 2000H
Mov AL, 00100000B
out DX, AL

Mov DX, 2000H
Mov AL, 00110000B
out DX, AL

Mov DX, 2000H
Mov AL, 00111000B
out DX, AL

Mov DX, 2000H
Mov AL, 00111100B
out DX, AL

Mov DX, 2000H
Mov AL, 00111110B
out DX, AL

Mov DX, 2030H
Mov AL, 00011111B
out DX, AL

Mov DX, 2030H
Mov AL, 00111111B
out DX, AL

Mov CX, 04FH
L3: Loop L3

Mov DX, 2005H
Mov AL, 01000000B
out DX, AL

Mov DX, 2005H
Mov AL, 01100000B
out DX, AL

Mov DX, 2005H
Mov AL, 01110000B
out DX, AL
```

```
Mov DX, 2005H
Mov AL, 01111000B
out DX, AL

Mov DX, 2005H
Mov AL, 01111100B
out DX, AL

Mov DX, 2005H
Mov AL, 01111110B
out DX, AL

Mov DX, 2006H
Mov AL, 00000001B
out DX, AL

Mov DX, 2007H
Mov AL, 00000001B
out DX, AL

Mov DX, 2008H
Mov AL, 00000001B
out DX, AL

Mov DX, 2009H
Mov AL, 00000010B
out DX, AL

Mov DX, 2009H
Mov AL, 00000110B
out DX, AL

Mov DX, 2009H
Mov AL, 00001110B
out DX, AL

Mov DX, 2009H
Mov AL, 00011110B
out DX, AL

Mov DX, 2009H
Mov AL, 00111110B
out DX, AL

Mov DX, 2009H
Mov AL, 01111110B
out DX, AL

Mov DX, 2006H
Mov AL, 00001001B
out DX, AL

Mov DX, 2007H
Mov AL, 00001001B
out DX, AL

Mov DX, 2008H
Mov AL, 00001001B
out DX, AL

Mov CX, 04FH
L03: Loop L03
```

```
Mov   DX, 200EH
Mov   AL, 00000001B
out   DX, AL

Mov   DX, 200DH
Mov   AL, 00000001B
out   DX, AL

Mov   DX, 200CH
Mov   AL, 00000001B
out   DX, AL

Mov   DX, 200BH
Mov   AL, 00000001B
out   DX, AL

Mov   DX, 200AH
Mov   AL, 00000001B
out   DX, AL

Mov   DX, 2031H
Mov   AL, 00000001B
out   DX, AL

Mov   CX, 04FH
L4: Loop L4

Mov   DX, 200AH
Mov   AL, 00000011B
out   DX, AL
```

```
Mov   DX, 200AH
Mov   AL, 00000111B
out   DX, AL

Mov   DX, 200AH
Mov   AL, 00001111B
out   DX, AL

Mov   DX, 2031H
Mov   AL, 00100001B
out   DX, AL

Mov   CX, 04FH
L5: Loop L5

Mov   DX, 200BH
Mov   AL, 00001001B
out   DX, AL

Mov   DX, 200CH
Mov   AL, 00001001B
out   DX, AL

Mov   DX, 200DH
mov   AL, 00001001B
out   DX, AL

Mov   DX, 2031H
mov   AL, 01100001B
out   DX, AL
```

```
        Mov CX, 04FH
        L6: Loop L6

        Mov  DX, 200EH
        Mov AL, 00010001B
        out DX, AL

        Mov  DX, 200EH
        Mov AL, 0011 0001B
        out DX, AL

        Mov  DX, 2031H
        Mov AL, 01100101B
        out DX, AL

        Mov CX, 04FH
        L7: Loop L7

        Mov DX, 200DH
        Mov AL, 01001001B
        out DX, AL

        Mov DX, 200CH
        Mov AL, 01001001B
        out DX, AL

        Mov DX, 200BH
        Mov AL, 01001001B
        out DX, AL

        Mov DX, 200AH
        Mov AL, 00101111B
        out DX, AL

        Mov DX, 2031H
        Mov AL, 01101101B
        out DX, AL

        Mov CX, 04FH
        L8: Loop L8

        Mov DX, 200FH
        Mov AL, 00000111B
        out DX, AL

        Mov DX, 200FH
        Mov AL, 00001111B
        out DX, AL

        Mov DX, 200FH
        Mov AL, 00111111B
        out DX, AL

        Mov DX, 2010H
        Mov AL, 00001000B
        out DX, AL

        Mov DX, 2011H
        Mov AL, 00001000B
        out DX, AL
```

```
Mov  DX, 2012H            Mov  CX, 04FH
Mov  AL, 00001000B        L04: Loop L04
OUT  DX, AL
                          Mov  DX, 2017H
Mov  DX, 2013H            Mov  AL, 00000001B
Mov  AL, 00000001B        OUT  DX, AL
OUT  DX, AL
                          Mov  DX, 2016H
Mov  DX, 2013H            Mov  AL, 00000010B
Mov  AL, 00000011B        OUT  DX, AL
OUT  DX, AL
                          Mov  DX, 2015H
Mov  DX, 2013H            Mov  AL, 00000100B
Mov  AL, 00000111B        OUT  DX, AL
OUT  DX, AL
                          Mov  DX, 2014H
Mov  DX, 2013H            Mov  AL, 00001000B
Mov  AL, 00001111B        OUT  DX, AL
OUT  DX, AL
                          Mov  DX, 2032H
Mov  DX, 2013H            Mov  AL, 00100000B
Mov  AL, 00011111B        OUT  DX, AL
OUT  DX, AL
                          Mov  CX, 04FH
Mov  DX, 2013H            L9: Loop L9
Mov  AL, 00111111B
OUT  DX, AL               Mov  DX, 2014H
                          Mov  AL, 00011000B
Mov  DX, 2013H            OUT  DX, AL
Mov  AL, 01111111B
OUT  DX, AL
```

```asm
Mov DX, 2015H
Mov AL, 00010100B
out DX, AL

Mov DX, 2016H
Mov AL, 00010010B
out DX, AL

Mov DX, 2017H
Mov AL, 00010001B
out DX, AL

Mov DX, 2018H
Mov AL, 00010000B
out DX, AL

Mov DX, 2032H
Mov AL, 01100000B
out DX, AL

Mov CX, 04FH
L10: Loop L10

Mov DX, 2017H
Mov AL, 00010011B
out DX, AL
Mov DX, 2017H
Mov AL, 00010111B
out DX, AL

Mov DX, 2017H
Mov AL, 00011111B
out DX, AL

Mov DX, 2032H
Mov AL, 01100010B
out DX, AL

Mov CX, 04FH
L11: Loop L11

Mov DX, 2017H
Mov AL, 00111111B
out DX, AL

Mov DX, 2017H
Mov AL, 01111111B
out DX, AL

Mov DX, 2032H
Mov AL, 01100110B
out DX, AL

Mov CX, 04FH
L12: Loop L12

Mov COUNTER, 0
Mov SI, 25
```

```asm
CONTINUE:

        MOV DX, 2018H

        MOV CX, 26

        DEC SI


        INC COUNTER

        CMP COUNTER, 26

        JAE CLEARO

SCROLL:

        MOV AL, DOT_MATRIX [SI]

        OUT DX, AL


        INC SI

        DEC DX


        CMP DX, 1FFFH

        JBE CONTINUE


        CMP SI, 25

        JAE NEXT

        LOOP SCROLL

NEXT:

        MOV SI, 0

        LOOP SCROLL
```

```asm
CLEARO:

        MOV CX, 04FH

L13 : Loop L13

        MOV DX, 2070H

        MOV AL, 00000000B

        OUT DX, AL

        MOV DX, 2000H

CLEAR1:

        MOV AL, 00000000B

        OUT DX, AL

        INC CX
        INC DX

        CMP CX, 26

        JLE CLEAR1

        MOV CX, 04FH

L14: LOOP L14

        MOV DX, 2030H

        MOV AL, 00000000B
        OUT DX, AL

        MOV DX, 2031H
        MOV AL, 00000000B
        OUT DX, AL
```

```asm
MOV DX, 2032H
MOV AL, 00000000B
OUT DX, AL

MOV CX, 0
INC DI
CMP DI, 5
JL DISPLAY

START ENDP
CSEG ENDS
END START
```