Lab Report

Experiment No: 1

Experiment Name: Arithmetic operations in 8086 trainer KIT: Multi-byte Addition, Subtraction, Multiplication, and Division

Course Code : CSE-3524

Course Title : Microprocessor, Microcontroller and Embedded System Sessional

Submitted by:

Name : Iftehaz Newaz
ID : *******
Section : 5AM
Semester : 5th

Submitted to :

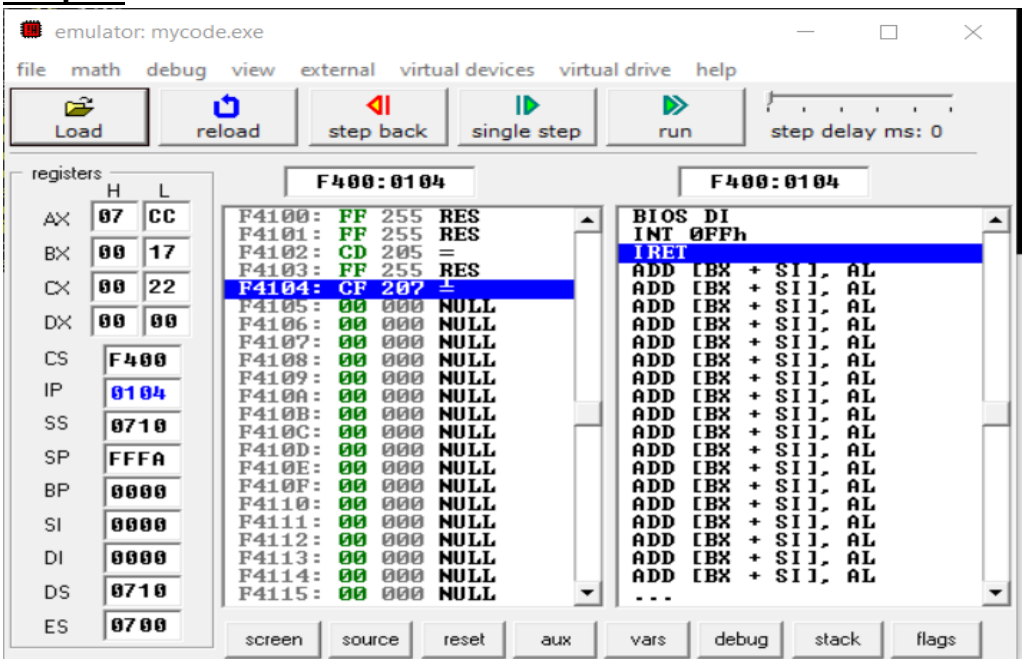
Mr. Muhammad Kamrul Hossain Patwary
Guest Teacher
CSE,IIUC

Code:

Addition:

```
data segment
a db 00B5h
b db 17h
c dw ?
data ends
code segment
assume cs:code,ds:data
start:
mov ax,data
mov ds,ax
mov al,a
mov bl,b
add al,bl
mov c,ax
int 3
code ends
end start
```

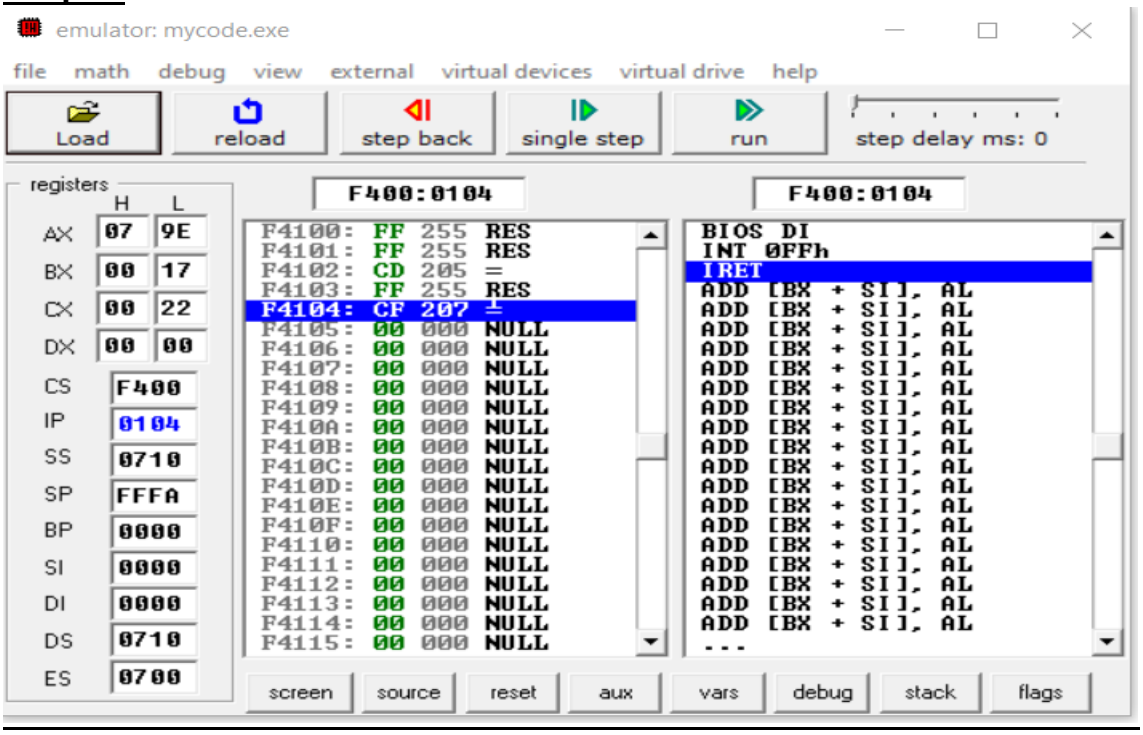
Output:



Subtraction:

```
data segment
a db 00B5h
b db 17h
c dw ?
data ends
code segment
assume cs:code,ds:data
start: mov ax,data
mov ds,ax
mov al,a
mov bl,b
sub al,bl
mov c,ax
int 3
code ends
end start
```

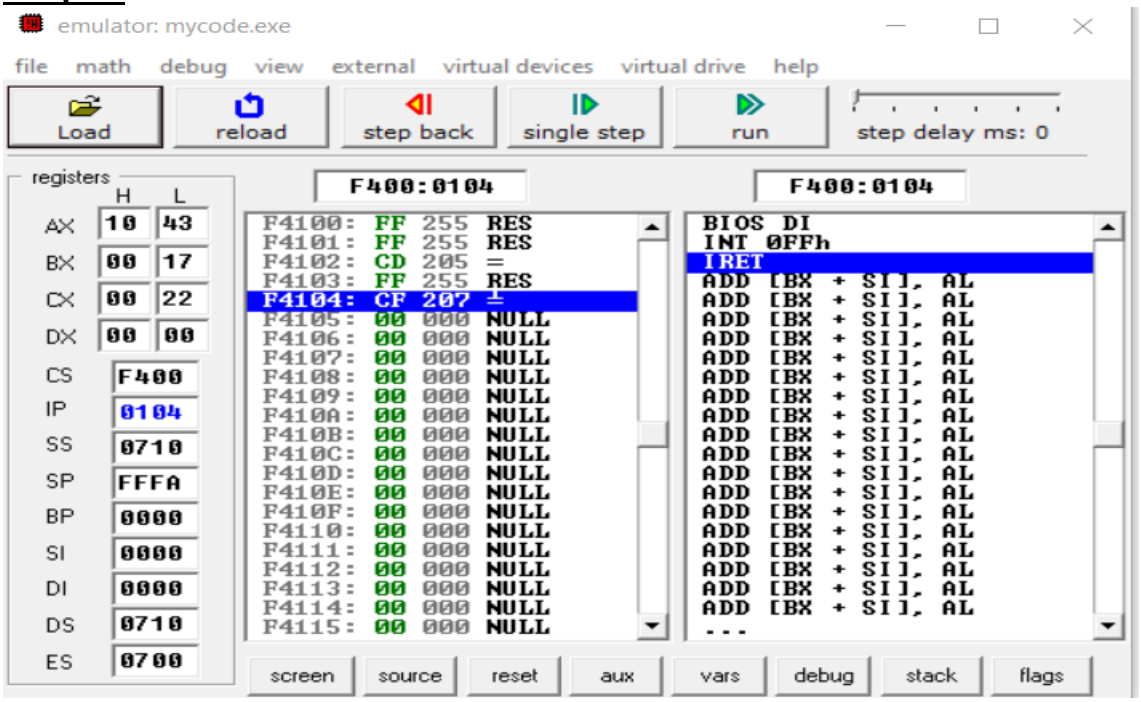
Output:



Multiplication:

```
data segment
a db 00B5h
b db 17h
c dw ?
data ends
code segment
assume cs:code,ds:data
start:
mov ax,data
mov ds,ax
mov al,a
mov bl,b
mul bl
mov c,ax
int 3
code ends
end start
```

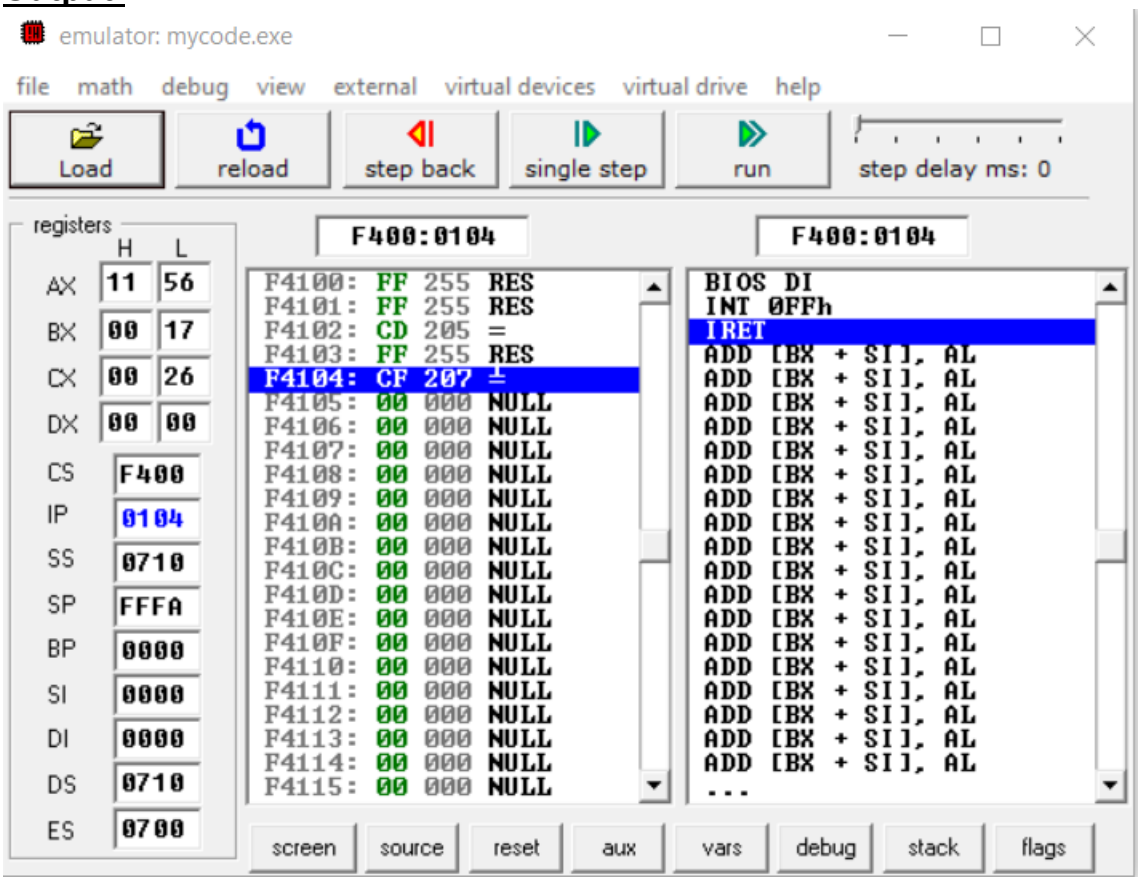
Output:



Division:

```
data segment
a db 203 ;AX=00CBh
b db 17h ;BL=04h
c db ?
d db ?
data ends
code segment
assume cs:code,ds:data
start:
mov ax,data
mov ds,ax
mov al,a mov bl,b
div bl   ; AL=50(32h), AH=3
mov c,al
mov d,ah
int 3
code ends
end start
```

Output:


emulator: mycode.exe
file math debug view external virtual devices virtual drive help
Load
reload
step back
single step
run
step delay ms: 0
registers
H L
AX 11 56
BX 00 17
CX 00 26
DX 00 00
CS F400
IP 0104
SS 0710
SP FFFA
BP 0000
SI 0000
DI 0000
DS 0710
ES 0700
F400:0104
F4100: FF 255 RES
F4101: FF 255 RES
F4102: CD 205 =
F4103: FF 255 RES
F4104: CF 207 ╧
F4105: 00 000 NULL
F4106: 00 000 NULL
F4107: 00 000 NULL
F4108: 00 000 NULL
F4109: 00 000 NULL
F410A: 00 000 NULL
F410B: 00 000 NULL
F410C: 00 000 NULL
F410D: 00 000 NULL
F410E: 00 000 NULL
F410F: 00 000 NULL
F4110: 00 000 NULL
F4111: 00 000 NULL
F4112: 00 000 NULL
F4113: 00 000 NULL
F4114: 00 000 NULL
F4115: 00 000 NULL
F400:0104
BIOS DI
INT 0FFh
IRET
ADD [BX + SI], AL
...
screen source reset aux vars debug stack flags

Lab Report

Experiment No: 2

Experiment Name: Experiments with 8086 Interrupt System

Course Code : CSE-3524

Course Title : Microprocessor, Microcontroller and Embedded System Sessional

Submitted by:

Name : Iftehaz Newaz
ID : *******
Section : 5AM
Semester : 5th

Submitted to :

Mr. Muhammad Kamrul Hossain Patwary
Guest Teacher
CSE,IIUC

Code:

Internal Interrupt: Division by zero(type 0)

```
Code  Segment
      Assume CS:CODE, DS: CODE, ES: CODE, SS: CODE
      ;
      ORG   1000H
      MOV   AX,1234H
      MOV   BL,00H
      DIV    BL
      NOP
      NOP
```

Overflow Interrupt:

```
CODE SEGMENT
      ASSUME CS:CODE, DS: CODE, ES: CODE, SS: CODE
      ;
      ORG   1000H
      MOV   AX,1234H
      MOV   BX,7234H
      INTO
      NOP
      NOP
      NOP
      INT
      ;
CODE ENDS
      END
```

Lab Report

Experiment No: 3

Experiment Name: Interface 8255A with seven segment display using MDA-8086 kit

Course Code : CSE-3524

Course Title : Microprocessor, Microcontroller and Embedded System Sessional

Submitted by:

Name : Iftehaz Newaz
ID : *******
Section : 5AM
Semester : 5th

Submitted to :

Mr. Muhammad Kamrul Hossain Patwary
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Code:

```
CODE    SEGMENT
        ASSUME      CS:CODE,DS:CODE,ES:CODE,SS:CODE
        ;
PPIC_C  EQU     1FH
PPIC    EQU     1DH
PPIB    EQU     1BH
PPIA    EQU     19H
        ;
        ORG     1000H
        MOV     AL,10000000B
        OUT     PPIC_C,AL
        ;
        MOV     AL,11110000B
        OUT     PPIB,AL
        ;
        MOV     AL,00000000B
        OUT     PPIC,AL
        ;
L2:     MOV     SI,OFFSET DATA
L1:     MOV     AL,BYTE PTR CS:[SI]
        CMP     AL,00H
        JE      L2
        OUT     PPIA,AL
        CALL    TIMER
        INC     SI
        JMP     L1
        ;
        INT     3
        ;
TIMER:  MOV     CX,0
TIMER1:         NOP
        NOP
        NOP
        NOP
        LOOP    TIMER1
        RET
        ;
DATA:   DB      10110000B
        DB      00H
CODE    ENDS
        END
```

Output:

Lab Report

Experiment No: 4

Experiment Name: Interface 8255A with simple LED light using MDA-8086 kit

Course Code : CSE-3524

Course Title : Microprocessor, Microcontroller and Embedded System Sessional

Submitted by:

Name : Iftehaz Newaz
ID : *******
Section : 5AM
Semester : 5th

Submitted to :

Mr. Muhammad Kamrul Hossain Patwary
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CODE:

```
CODE SEGMENT
        ASSUME      CS:CODE,DS:CODE,ES:CODE,SS:CODE
        ;
PPIC_C      EQU   1FH
PPIC    EQU   1DH
PPIB    EQU   1BH
PPIA    EQU   19H
        ;
        ORG   1000H
        MOV   AL,10000000B
        OUT   PPIC_C,AL
        ;
        MOV   AL,11111111B
        OUT   PPIA,AL
        ;
        MOV   AL,00000000B
        OUT   PPIC,AL
        ;
L1:     MOV   AL,11110001B
L2:     OUT   PPIB,AL
        CALL  TIMER
        SHL   AL,1
        TEST  AL,00010000B
        JNZ   L1
        OR    AL,11110000B
        JMP   L2
        ;
        INT   3
        ;
TIMER:      MOV   CX,1
TIMER2:     PUSH  CX
        MOV   CX,0
TIMER1:     NOP
        NOP
        NOP
```

```
        NOP
        LOOP TIMER1
        POP  CX
        LOOP TIMER2
        RET
        ;
CODE ENDS
        END
```

OUTPUT:

Lab Report

Experiment No: 5

Experiment Name: Interface 8255A with dot matrix display using MDA-8086 kit

Course Code : CSE-3524

Course Title : Microprocessor, Microcontroller and Embedded System Sessional

Submitted by:

Name : Iftehaz Newaz
ID : *******
Section : 5AM
Semester : 5th

Submitted to :

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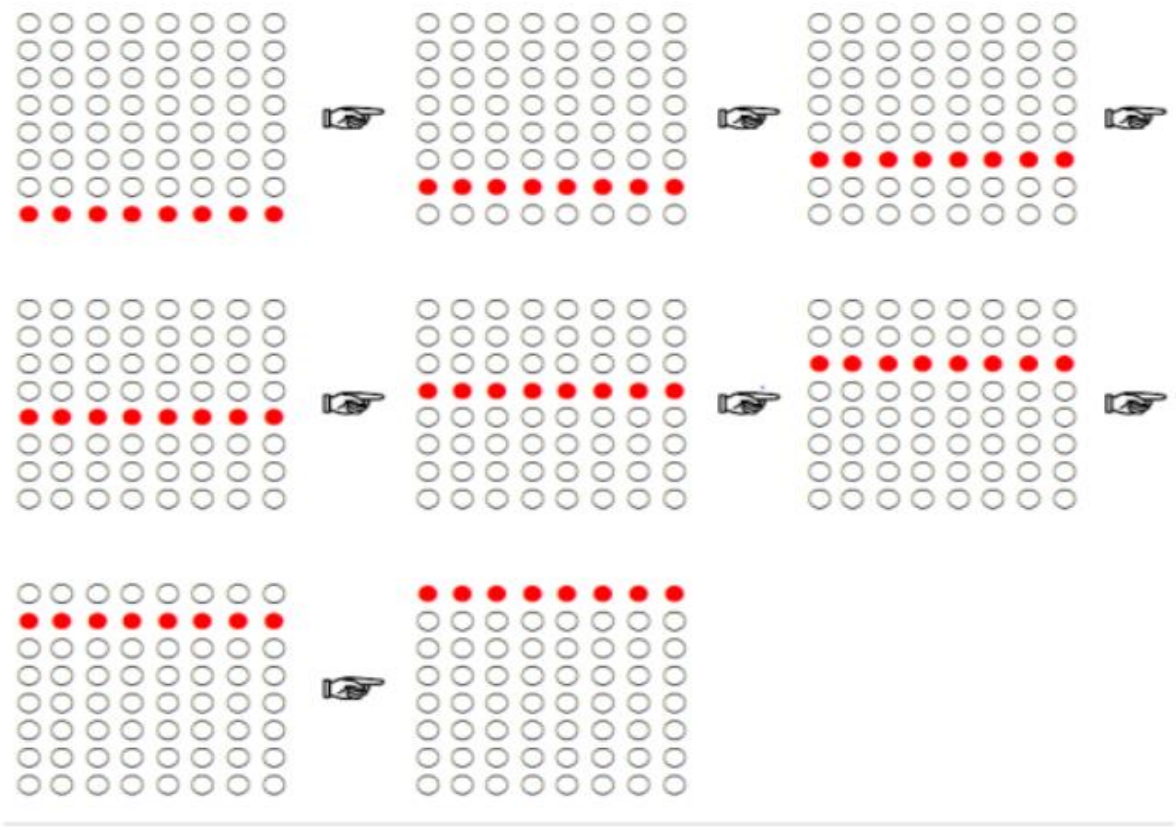
Code:

Row-wise:

```
CODE SEGMENT
        ASSUME      CS:CODE,DS:CODE,ES:CODE,SS:CODE
        ;
PPIC_C      EQU   1EH ; control register
PPIC    EQU   1CH
PPIB    EQU   1AH
PPIA    EQU   18H
        ;
        ORG   1000H
        MOV   AL,10000000B
        OUT   PPIC_C,AL
        ;
        MOV   AL,11111111B
        OUT   PPIA,AL
        ;
        MOV   AL,11111111B
        OUT   PPIB,AL
        ;
L1:     MOV   AL,11111110B
L2:     OUT   PPIC,AL
        CALL  TIMER
        STC
        ROL   AL,1
        JC    L2
        JMP   L1
        ;
        INT   3
        ;
TIMER:      MOV   CX,0FFFFH
TIMER1:     NOP
        NOP
        NOP
        NOP
        LOOP  TIMER1
```

```
        RET
        ;
CODE ENDS
        END
```

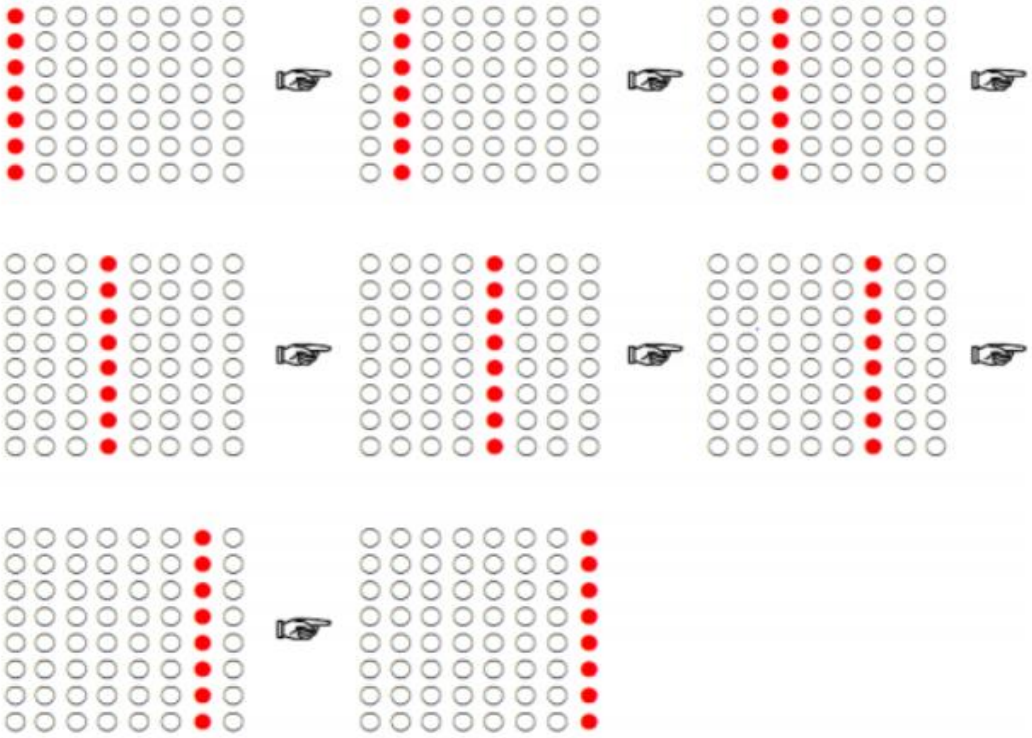
OUTPUT:



Column-wise:

```
CODE SEGMENT
        ASSUME      CS:CODE,DS:CODE,ES:CODE,SS:CODE
        ;
PPIC_C      EQU   1EH ; control register
PPIC    EQU   1CH
PPIB    EQU   1AH
PPIA    EQU   18H
        ;
        ORG   1000H
        MOV   AL,10000000B
        OUT   PPIC_C,AL
        ;
        MOV   AL,00000000B
        OUT   PPIC,AL
        ;
L1:     MOV   AL,10000000B
L2:     OUT   PPIB,AL
        CALL  TIMER
        CLC
        ROR   AL,1
        JNC   L2
        JMP   L1
        ;
        INT   3
        ;
TIMER:      MOV  CX,0FFFFH
TIMER1:     NOP
        NOP
        NOP
        NOP
        LOOP TIMER1
        RET
        ;
CODE ENDS
        END
```

Output:



Letter-'A':

```
CODE SEGMENT
        ASSUME      CS:CODE,DS:CODE,ES:CODE,SS:CODE
        ;
PPIC_C      EQU   1EH ; control register
PPIC    EQU   1CH ; c port
PPIB    EQU   1AH
PPIA    EQU   18H
        ;
        ORG   1000H
        MOV   AL,10000000B
        OUT   PPIC_C,AL
        ;
        MOV   AL,11111111B
```

```
        OUT   PPIA,AL
        ;
L1:     MOV  SI,OFFSET FONT
        ;
        MOV  AH,10000000B
        ;

L2:     MOV  AL,BYTE PTR CS:[SI]
        OUT   PPIC,AL
        ;
        MOV  AL,AH
        OUT   PPIB,AL
        CALL  TIMER
        INC    SI
        CLC
        ROR   AH,1
        JNC    L2
        JMP   L1
        ;
        INT    3
        ;
TIMER:        MOV  CX,300
TIMER1:       NOP
        NOP
        NOP
        NOP
        LOOP TIMER1
        RET
        ;
FONT:  DB     11111111B
      DB     11000000B
      DB     10110111B
      DB     01110111B
      DB     01110111B
      DB     10110111B
      DB     11000000B
      DB     11111111B
```

```
CODE ENDS
     END
```

Output: