

.MODEL SMALL

.DATA

KEYS DB '0123456789ABCDEFGHIJKLMN'

M1 DB 10,13,'Row: \$'

M2 DB 10,13,'Column: \$'

M3 DB 10,13,'Value: \$'

ROW DB ?

COL DB ?

PA EQU 0D800H

PB EQU 0D801H

PC EQU 0D802H

CW EQU 0D803H

.CODE

MOV AX,@DATA

MOV DS,AX

MOV DX,CW

MOV AL,90H ;port A is input

OUT DX,AL

READ:

MOV DX,PC ;trigger port C for row 1

MOV AL,01H

OUT DX,AL

MOV DX,PA ;read input from port A

IN AL,DX

CMP AL,00H

JNZ FR

MOV DX,PC ;trigger port C for row 2

MOV AL,02H

OUT DX,AL

MOV DX,PA ;read input from port A

IN AL,DX

CMP AL,00H

JNZ SR

MOV DX,PC ;trigger port C for row 3

MOV AL,04H

```

        OUT DX,AL

        MOV DX,PA           ;read input from port A
        IN AL,DX
        CMP AL,00H
        JNZ TR
    JMP READ

FR:                                     ;First row
    MOV ROW,31H
    MOV COL,31H
    LEA SI,KEYS

    L1:
        SHR AL,01H         ;shift right until you get column
        JC DISPLAY
        INC COL
        INC SI
    JMP L1

SR:                                     ;Second row
    MOV ROW,32H
    MOV COL,31H
    LEA SI,KEYS+8D

    L2:
        SHR AL,01H         ;shift right until you get column
        JC DISPLAY
        INC COL
        INC SI
    JMP L2

TR:                                     ;Third row
    MOV ROW,33H
    MOV COL,31H
    LEA SI,KEYS+16D

    L3:
        SHR AL,01H         ;shift right until you get column
        JC DISPLAY
        INC COL
        INC SI
    JMP L3

```

DISPLAY:

```
    LEA DX,M3          ;display value
    MOV AH,09H
    INT 21H
    MOV DL,[SI]        ;extract character
    MOV AH,02H
    INT 21H
```

```
    LEA DX,M1          ;display row
    MOV AH,09H
    INT 21H
    MOV DL,ROW
    MOV AH,02H
    INT 21H
```

```
    LEA DX,M2          ;display column
    MOV AH,09H
    INT 21H
    MOV DL,COL
    MOV AH,02H
    INT 21H
```

```
MOV AH,4CH
INT 21H
```

END