



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ

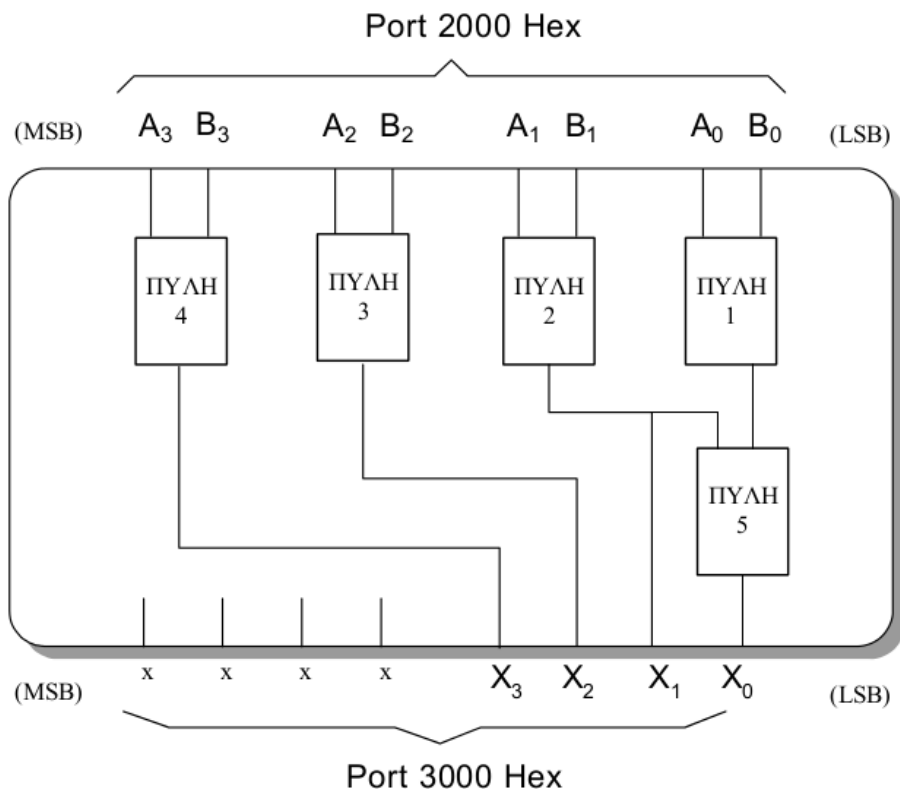
ΣΧΟΛΗ ΗΜ&ΜΥ

Εργαστήριο Μικροϋπολογιστών 2^η Εργαστηριακή Άσκηση
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Ομάδα C07

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Σχήμα 1: Το IC του θέματος

Άσκηση 3(i)

```

1  START: LDA 2000H
2      CALL XOR
3      CALL XOR
4      CALL XOR
5      CALL XOR
6      MOV D,C
7      MOV A,C
8      RAR
9      MOV C,A
10     MOV A,D
11     RAL
12     RAL
13     RAL
14     RAL
15     RAL
16     RAL
17     CALL OR
18     MOV A,C
19     ANI 0FH
20     CMA
21     STA 3000H
22     JMP START
23
24
25     ;diabazei apo ton A,
26     ;wrhsimopoiei ton b ws buffer
27     ;grafei to apotelesma ston C
28     XOR: RAL ;CALL XOR
29         JC ONE ;XY
30         RAL ;0Y
31         JC TRUE ;0Y
32         JMP FALSE ;00
33     ONE: CMC ;1Y
34         RAL ;1Y
35         JC FALSEX ;11
36         JMP TRUE ;10

```

```

37
38 OR:    RAL      ;CALL OR;XY
39        JC TRUE   ;1Y
40        RAL      ;0Y
41        JC TRUE   ;11
42        JMP FALSE ;00
43
44 TRUE:   CMC
45        MOV B,A   ;USE B AS BUFFER
46        MOV A,C   ;LOAD PREVIOUS OUTCOME FORM C
47        RAL      ;SHIFT A
48        ORI 01H   ;ADD 1 IN THE END
49        JMP RESTORE
50
51 FALSEX: CMC
52 FALSE:  MOV B,A   ;USE B AS BUFFER
53        MOV A,C   ;LOAD PREV FROM C
54        RAL      ;SHIFT A
55        ANI FEH   ;ADD 0 IN THE END
56        JMP RESTORE
57
58 RESTORE
59        MOV C,A   ;RESTORE BUFFERS AS THEY WERE
60        MOV A,B
61        RET
62 END

```

Άσκηση 4(ii)

1		MVI A,10H
2		STA 0BB0H
3		STA 0BB1H
4		STA 0BB2H
5		STA 0BB3H
6		STA 0BB4H
7		STA 0BB5H
8		LXI D,0BB0H
9		CALL STDM
10	LP:	CALL KIND
11		MOV B,A
12		ANI 0FH
13		STA 0BB5H
14		MOV A,B
15		RLC
16		RLC
17		RLC
18		RLC
19		ANI 0FH
20		STA 0BB4H
21		LXI D,0BB0H
22		CALL STDM
23		JMP LP
24	END	

Άσκηση 4(iv)

```
1  START:
2      IN 10H
3
4  READ_BINARY:
5      LDA 2000H
6      RAL
7      JC NEGATIVE
8      JNC POSITIVE
9
10     ;ARNHTIKOS EINAI MONO OTAN MSB==1 , OPOTE KAI TON "METATREPW"
11
12  NEGATIVE:
13      RAR                ;GIA UNDO THN RAL
14      CMA                ;TO SUMPLHRWMA WS PROS 2 TOY SUMPLHRWMATOS WS PROS 2 MAS DINEI TON ARX ARIΣMO
15      INR A
16      MVI E,1CH        ;O E EXEI TO PROSHMO. 17 GIATI AYTO ANTISTOIXEI SE - STHN DCD
17      ;CMA                ;TO CMA XREIAZETAI GIATI PLEON OLOI ARITHMOI MOU EINAI 8ETIKOI
18      JMP DEC_CONVERSION
19
20  POSITIVE:
21      RAR                ;GIA UNDO RAL
22      MVI E,10H        ;O E EXEI TO PROSHMO , TO 10 GIATI AUTO ANTISTOIXEI SE KENO STHN DCD
23
24  DEC_CONVERSION:
25
26      MVI C,00H        ;STON C OI MONADES
27      MVI B,FFH        ;STON B OI DECADES , EBALA FF GIATI META KSEKINAW KANONTAS INR
28      MVI D,00H        ;STON D OI EKATONTADES
29
30  BCD_FINDER:
31      CPI 64H          ;SUGKRINW ME TO 100
32      JM ELEGX_DEC      ;AN EINAI DHL. NUMBER<100 H' ALLIWS (A)-100<O TOTE ELEGXEI DECADES
33      MVI D,01H        ;ALLIWS O ARITHMOS MAS EXEI MIA EKATONTADA
34      SUI 64H          ;FAIRW TO 100 KAI SUNEXIZW GIA DECADES
35
36  ELEGX_DEC:
37      INR B
38      SUI 0AH          ;FAIRW 10 KAI METRAW POSES DECADES AFAIRESA
39      JNC ELEGX_DEC     ;MEXRI NA MEINOUNE MONADES
40      ADI 0AH          ;DIORTHWSH YPOLOIPOU, PROSTHETW 10
41      MOV C,A          ;STON C OI MONADES
42
43  EMFANISH_STA_3DEKSIA_7SEGM:
44
45      ;===1o LSB PSHFIO===
46      LXI H,0990H      ;BAZW STON H::=C =LEAST SIGN BIT, TIS MONADES @ THESH MNMHMS 0990
47      MOV M,C
48
49      ;===2o LSB PSHFIO===
50      LXI H,0991H      ;BAZW STON H::=B =2o LSB TIS DEKADES @ THESH MNMHMS 0991
51      MOV M,B
52
53      ;===3o LSB PSHFIO===
54      LXI H,0992H      ;BAZW STON H::=L THN EKATONTADA (AN YPARXEI) @ THESH MNMHMS 0991
55      MOV M,D
56
57      ;===4o LSB PSHFIO===
58      LXI H,0993H      ;BAZW STON H::=E TO PROSHMO
59      MOV M,E
60
61      ;===5o LSB PSHFIO===
62      LXI H,0994H      ;EMFANIZEI KENA TA YPOLOIPA BITS
63      MVI M,10H
64
65      ;===6o (MSB)PSHFIO===
66      LXI H,0995H
67      MVI M,10H
68
69
70      LXI D,0990H      ; BAZW STON D THN THESH APO OPOU ARXIZEI TO LSB
71      CALL STDM        ; TA METAFEREI TA BITS NA TA PAREI H DCD KAI NA TA PAEI STA 7SEG
72      CALL DCD
73      JMP START        ; H DCD PAIRNEI TA PSHFIA KAI TA BAZEI STOUS 7SEGMENTS
74  END
```