

1^η Εργαστηριακή Άσκηση στο Εργαστήριο Μικροεπεξεργαστών

Ομάδα Β 3

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1^η Άσκηση

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1  start:
2      IN 10H
3      LXI B,03E8H      ;BC -> 1000dec (1ms*1000 = 1s)
4
5  count_up:
6      LDA 2000H      ; DIAVAZW TA DIP-SWITCHES
7      ANI 0FH      ; PETAW TA 4-MSB
8      CPI 00H      ; AN EINAI OLA SVISTA PERIMENE MEXRI NA ANAPSEI KAPOIO
9      JZ count_up
10     MOV D,A      ; KAI APOTHIKEYW STO D
11     MVI A,FFH      ; VAZW STO A TO FF ETSI WSTE +1 NA DINEI 0
12  cont_up:
13     MOV E,A      ; APOTHIKEYW STO E THN CURRENT TIMH TOU METRITH
14  lock_up:
15     LDA 2000H      ; DIAVAZW KSANA TA DIP-SWITCHES
16     ANI 80H      ; KRATAW TO MSB
17     CPI 80H      ; ELEGXW AN EINAI 1
18     JNZ lock_up      ; AN DEN EINAI KSANA ELEGXW
19     MOV A,E      ; ALLIWS VAZW STO A TIMH TOY METRITH
20     INR A      ; AYKSANW THN TIMH TOY METRITH
21     CMA
22     STA 3000H      ; CMA LOGO ARNITIKIS LOGIKIS STOUS DIAKOPTES
23     CALL DELB
24     CMA
25     CMP D      ; SIGKRINW ME TON ARITHMO POU DOTHIKE STA 4 LSB DIP SWITCHES
26     JZ count_down      ; OTAN FTASEI STON ARITHMO KSEKINAEI ANTISTROFI METRISI
27     JMP cont_up
28
29  count_down:
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30     MOV E,A
31 lock_down:
32     LDA 2000H ; CHECK FOR MSB
33     ANI 80H
34     CPI 80H
35     JNZ lock_down
36     MOV A,E
37     DCR A
38     CMA
39     STA 3000H
40     CMA
41     CPI 00H ; ELEGXO AN EFTASE STO 0
42     JZ count_up ; ALLAZW SE COUNT UP
43     CALL DELB ; DEN KALEITAI KATHISTERISI GIA TO 0 GIATI GINETAI STO COUNT UP
44     JMP count_down ; ALLIWS SINEXISE TIN ANTISTROFI METRISI
45
46     END

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2^η Άσκηση

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1     IN 10H
2     START:
3     CALL KIND ; FERE APO TO PLIKTROLOGIO
4     CPI 10H ; AN A>0x0F
5     JNC START ; PARE NEO NUM
6     RLC ; x2
7     RLC ; x4
8     RLC ; x8
9     RLC ; x16
10    MOV B,A ; GRAPSE TON A STO B
11    FERE_Y:
12    CALL KIND ; FERE KAI TON EPOMENO
13    CPI 10H
14    JNC FERE_Y
15    ADD B ; A = 16x + y
16    MVI B,00H ; MHDENIZW TON B
17    MVI C,00H ; MHDENIZW TON C
18    EKATONTADES:
19    CPI 64H ; SYGKRINW ME TO 100
20    JC DEKADES ; AN EINAI MIKROTERO EKSETAZW TO 10
21    INR C ; PROSTHETO 1 STON DEIKTH TWN EKATONTADWN
22    SUI 64H ; AFAIRW 100
23    JMP EKATONTADES
24    DEKADES:
25    CPI 0AH ; SYGKRINW ME TO 10
26    JC DONE ; AN EINAI MIKROTERO TELEIWSA
27    INR B ; PROSTHETW ALLO ENA

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28 SUI 0AH ; AFAIRW 10
29 JMP DEKADES
30 DONE:
31 STA 0A00H ; GRAPSE TO PSIFIO TWN MONADWN
32 MOV A,B ; BALE TIS DEKADES STON ACUM
33 STA 0A01H ; GRAPSE TO PSIFIO TWN DEKADWN
34 MOV A,C ; OMOIWS ME EKATONTADES
35 STA 0A02H
36 LXI D,0A00H ;FORTONO STO ZEVGOS D-E TIN THESI MNIMIS POU ARXIZOUN TA SEGMENTS
37 CALL STDM ;METAKINEI TO MINIMA POU KSEKINA STIN PARAPANW DIEUTHINSI STIN
38 CALL DCD ;DIEUTHINSI POU TO PERIPENEI I DCD, DCD PAROUSIAZEI STA SEGMENTS
39 JMP START
40 END

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3^η Άσκηση

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1 IN 10H
2 LXI D,0101H ; D -> FLAG 0b1 = LEFT & E -> LSB DIP-SWITCH
3 MVI B,FEH ; THESH TOY VAGONETOY
4 MOV A,B ; ARXIKOPOIW TA LED NA DEIXNOYN TH THESI TOY VAGONETOY
5 STA 3000H
6 CALL MYDELAY
7 START:
8 PUSH D ; APOTHILKEYSE TON D KAI TON E (DIPLO KATA XORITI)
9 FAIL:
10 LDA 2000H ; FORTWSE TA DIP-SWITCHES STO A
11 MOV E,A
12 RLC ; FERE TO MSB STO LSB
13 MVI D,01H ; VALE MASKA TO 0b1
14 ANA D
15 CMP D ; AN LOIPON TO MSB EINAI ANOIKTO PROXWRA
16 JNZ FAIL
17 MOV A,E ; EPANAFERE TIMI TWN SWITCHES
18 ANA D ; VALE PALI TH MASKA 0x1 STON A
19 POP D ; EPISTREPSE TON D KAI TON E
20 CMP E ; E = 01H
21 JZ CONT ; AN EINAI ISA SHMAINEI DEN ALLAKSE TO LSB ARA SYNEXIZW
22 CALL CHANGE_DIR ; ROUTINA GIA ALLAGH KATEYUYN SHS
23 MOV A,E ; ALLAZW THN TIMH TOU DIP-SWITCH
24 XRI 01H ;
25 MOV E,A ; APOTHIKEYW
26
27 CONT:
28 CALL CHECK_EDGE ; PRIN KSEKINHSW ELEGXW AN EIMAI STHN AKRH
29 MOV A,D ; ALLIWS KOITAZW THN FORA TOY VAGONETOY
30 CPI 01H ; ELEGXW
31 JNZ GO_RIGHT ; AN EINAI D=0x1 ARISTERA ALLIWS DEKSIA

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32  MOV A,B ; VAZW THN CURRENT THESI TOY STON A
33  CALL MOVL ; KAI KANW ARISTERA
34  JMP START ; EPISTREFW
35  GO_RIGHT:
36  CALL MOVR ; OMOIWS DEKSIA
37  JMP START
38
39  CHECK_EDGE:
40  MOV A,B ; PAIRNW TH THESH
41  CPI 7FH ; AN EINAI TERMA ARISTERA
42  JNZ RIGHT_CHECK
43  MOV A,D ; PERNW THN FORA TOY
44  CPI 01H ; AN !!KAI!! H FORA EINAI ARISTERA
45  JNZ NO_EDGE ;
46  CALL CHANGE_DIR ; ALLAZW KATEYTHYNH
47  CALL MYDELAY ; VAZW KAI TO EXTRA DELAY
48  RET
49  RIGHT_CHECK: ; ALLIWS KANW TOYS IDIOYS ELEGXOYS GIA DEKSIA
50  CPI FEH ; EINAI TERMA DEKSIA ???
51  JNZ NO_EDGE
52  MOV A,D
53  CPI 00H ; EXEI FORA PROS TA DEKSIA ???
54  JNZ NO_EDGE
55  CALL CHANGE_DIR
56  CALL MYDELAY
57  RET
58  NO_EDGE: ; ALLIWS APLA SYNEXIZW
59  RET
60
61  CHANGE_DIR: ; ROUTINA ALLAGHS FORAS
62  MOV A,D ; PAIRNW TH THESH MNHMHS POY EXW TH FORA
63  XRI 01H ; THN ANTISTREFW
64  MOV D,A ; APOTHIKEYW
65  RET
66  MOVL: ; ROUTINA KINHSHS ARISTERA
67  MOV A,B ; PAIRNW THESH VAGONETOU
68  RLC ; METAKINW ARISTERA
69  STA 3000H ; EMFANIZW STA LED
70  CALL MYDELAY ; VAZW KATHISTERISH
71  MOV B,A ; KAI TELOS APOTHIKEYW PISW
72  RET
73  MOVR: ; OMOIWS ROUTINA GIA KINHSH DEKSIA
74  MOV A,B
75  RRC
76  STA 3000H
77  CALL MYDELAY
78  MOV B,A
79  RET

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80 MYDELAY:      ; ROUTINA GIA KATHISTERISH 0.5 SEC
81  PUSH B
82  LXI B,01F4H ; FORTWNW STO B-C POSO XRONO THELW
83  CALL DELB   ; KAI TREXW GNWSTH ROUTINA
84  POP B
85  RET
86  END
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