

Εργαστήριο Μικροϋπολογιστών

2η Εργαστηριακή άσκηση

Ομάδα Γ04

Συνεργάτες:

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Γενικό Θέμα 8085

Η λειτουργία του προγράμματος εξηγείται στα σχόλια.

IN 10H

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START:      LXI H,0A00H      ;ACCUMULATOR IS ZERO
            MVI C,00H        ;AT THE START
INITIAL:    MVI M,10H
            INX H
            MVI M,10H
            INX H
            MVI M,10H
            INX H
            MVI M,10H      ;WE DO NOT HAVE AN OPERATION
            INX H          ;NONE OUTPUT
NEWNUM:     CALL SHOWACC     ;WAIT FOR NEW NUMBERS or INCR THE
                           ;ACC BUT SHOW THE ACCUMULATOR

WAITN1:     CALL KIND        ;CALLS INTERNALLY DCD AND STDH
            CPI 83H          ;if we select to incr the acc
            JZ INCRACC       ;B HAS THE RESULT IN HEX
            CPI 81H          ;IF WE SELECT TO ZERO THE ACC
            JZ ZEROACC
            JMP ISNUM

ZEROACC:    MVI C,00H
            CALL SHOWACC
            JMP WAITN1

INCRACC:    MOV A,B          ;A=RESULT IN HEX
            ADD C            ;A=(ACC+RESULT)MOD 256
            MOV C,A          ;SAVE A IN C
            CALL SHOWACC
            JMP WAITN1

ISNUM:      CPI 10H          ;IF IS NUMBER THEN A< 16DEC AND CARRY
                           ;BECOMES 1
            JNC WAITN1       ;ELSE WAIT AGAIN FOR N1
            STA 0A05H        ;SHOW THE FIRST NUMBER CODE==NUMBER
            MVI A,17H        ;WAIT FOR 2ND NUMBER
            STA 0A04H        ;2ND NUMBER MUST BE NONE
            CALL SHOWIT

WAITN2:     CALL KIND        ;WAIT FOR SECOND NUMBER
            CPI 10H          ;IF IS NUMBER THEN A< 16DEC AND CARRY
BECOMES 1   JNC WAITN2       ;ELSE WAIT AGAIN FOR N2
            STA 0A04H        ;SHOW THE FIRST NUMBER
            CALL SHOWIT

WAITOP:     CALL KIND        ;WAIT FOR THE OPERATOR
            CPI 0AH          ;A MEANS SUM
            JZ SUMING
            CPI 0FH          ;F MEANS MULTIPLICATION
            JZ MULTIP
            JMP WAITOP       ;ELSE CHECK AGAIN FOR OPERATOR
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SUMING:      MVI A,00H          ;A=0
              LXI H,0A04H      ;(HL)=2ND NUM
              ADD M
              INX H            ;(HL) = 1ST NUM
              ADD M            ;A=NUM1 + NUM2
              MOV B,A          ;B=RESULT
              CALL HEXTODEC    ;SHOW THE RESULT
              JMP AGAIN

MULTIP:      LDA 0A05H
              MOV D,A          ;SAVE THE FIRST NUM IN D
              LDA 0A04H
              MOV E,A          ;SAVE THE 2ND NUM IN E
              MVI B,00H        ;RESULT=0

DOTHEM:      MOV A,E
              CPI 00H          ;IF E=0 THEN OVER
              JZ ENDMULT
              MOV A,B          ;A=PREVIOUS RESULT
              ADD D            ;A=A+NUM1
              MOV B,A          ;SAVE RESULT
              DCR E
              JMP DOTHEM

ENDMULT:     CALL HEXTODEC    ;SHOW THE RESULT

AGAIN:       JMP NEWNUM        ;CONTINUOUS FUNCTIONALITY

SHOWIT:      LXI D,0A00H
              CALL STDM        ;USE THE DISPLAY ROUTINES
              CALL DCD

RET

HEXTODEC:

              MOV A,B          ;A=RESULT
              LXI H,0A02H      ;HL=HUNDREADS
              MVI M,00H        ;HUNDREADS = 0 INITIAL

HUNDREADS:   CPI 64H          ;NUM < 100 => CARRY BECOMES 1
              JC DECADES
              INR M            ;(HUNDREADS)++
              SUI 64H          ;A=A-100DEC
              JMP HUNDREADS

DECADES:     ;A IS < 100DEC OF COURSE NOW
              DCX H            ;HL SHOW DECADES (0A01H)
              MVI M,00H        ;M=DECADES = 0

FINDDEC:     CPI 0AH          ;IF NUM < 10 THEN CARRY BECOMES 1
              JC DECUNITSOK
              INR M            ;DEC ++
              SUI 0AH          ;NUM = NUM -10
              JMP FINDDEC

DECUNITSOK:  ;A HAS THE UNITS NOW
              DCX H            ;HL=UNITS (0A00H)
              MOV M,A          ;SHOW THE UNITS TO THE RIGHT POSITION
              MOV A,C          ;C IS THE ACCUMULATOR
              ANI 0FH          ;THE 4 LSBS
              STA 0A04H        ;2ND HEX DIGIT
              MOV A,C

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                ANI F0H                ;THE 4 MSBS
                STA 0A05H              ;1ST HEX DIGIT
                CALL SHOWIT
RET

SHOWACC:        MOV A,C                ;A=ACC
                ANI 0FH                ;TAKE THE 4 LSBS
                STA 0A04H
                MOV A,C
                ANI F0H                ;THE SAME WITH 4 MSBS
                RRC
                RRC
                RRC
                STA 0A05H
                CALL SHOWIT
RET

END

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