**תרגיל בית 2**

מגישים:

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**קוד:**

.MODEL SMALL

.STACK 100h

.DATA

source DB 12 DUP (0)

EnterNum DB 13,10,'Enter number N for sqrt(up to 12 digits):',13,10,'$'

InvaliDigit DB 13,10,'Invalid number, please try again!!',13,10,'$'

PrintSqrt DB 13,10,'Sqrt(','$'

EndSqrt DB ')=','$'

PrintNum DB 13 DUP ('$')

Nsize EQU 12

result DB 7 DUP ('$')

C DD ?

P DD 0

X DD ?

Y DD ?

REM DD 0

M DD ?

SPOS DW 0

RPOS DW 0

TEN DB 10

.CODE

.386

;Function to remove the 13,10 from the string,the ENTER

DELETE\_ENTER PROC NEAR

LEA SI,source

ADD SI,AX

DEC SI ;point to the last char in the string

MOV CX,2 ;The "ENTER" string is assembled by 2 chars, 13 and 10

XOR BL,BL

EnterCheck: ;the loop goes through the last 2 chars and check their value

CMP [SI],BYTE PTR '0'

JB DELETE

CMP [SI],BYTE PTR '9'

JA DELETE

JMP CONTINUE1

DELETE:

MOV [SI],BYTE PTR 0

INC BL ;counts the amount of times that the loop deleted a char

CONTINUE1:

DEC SI

LOOP EnterCheck

RET

DELETE\_ENTER ENDP

;Function to check that the string is made of digits and not other chars

DigitCheck PROC NEAR

MOV BL,1 ;setting flag to 1

LEA SI,source

MOV CX,AX

isDigit:

CMP [SI],BYTE PTR '0'

JB Terminate

CMP [SI],BYTE PTR '9'

JA Terminate

JMP CONTINUE2

Terminate:

MOV AH,9 ; Set print option for int 21h

MOV DX,OFFSET InvaliDigit ; Point display string to InvaliDigit

INT 21H ; Print chosen message

MOV BL,0 ;flag = 0 - other unwanted chars were found

JMP TryAgain

CONTINUE2:

INC SI

LOOP isDigit ;the loop goes through all the chars in the source string

TryAgain:

RET

DigitCheck ENDP

MAIN:

MOV AX,@DATA

MOV DS,AX ;Set DS to point to data segment

MOV ES,AX ;Set ES to point to data segment for movsb command

inputNum:

MOV AH,9

MOV DX,OFFSET EnterNum ;print the EnterNum string

INT 21H

MOV DX,OFFSET source

MOV CX,Nsize ;getting input to source string for up to Nsize,12,chars

MOV AH,3FH

MOV BX,0

INT 21H

; Calling to a function to remove the 13,10 from the string

CALL DELETE\_ENTER

SUB AX,BX ;Decrease the unwanted chars amount from the string length

CALL DigitCheck

CMP BL,BYTE PTR 0 ;checking the flag from DigitCheck function 0-other chars no from 0-9 were found, 1-The string is Ok

JE inputNum

LEA DI,PrintNum

LEA SI,source

MOV CX,AX ;mov the string byte length to cx for the rep loop

;copy the source string to printNum string

REP MOVSB

;check if the sum of the digits is odd or not without changing the AL register

TEST AL,1

;Moving the num one byte forward and add 0 at the beginning

JZ EVEN1

MOV CX,AX

LEA SI,source

ADD SI,AX

BODY:

MOV BL,[SI-1]

MOV [SI],BL

DEC SI

LOOP BODY

MOV [SI], BYTE PTR '0'

EVEN1:

;

XOR EAX,EAX

LEA SI,source

ADD SI,SPOS

;

;While(source[spos]!=NULL)

CMP [SI], BYTE PTR '0'

JB PrintSolution

;making a 2 digit num m=[si]\*10 +[si+1]

MOV AL,BYTE PTR [SI]

SUB AL,'0'

MUL TEN ;[si]\*10

INC SI ;[si+1]

ADD AL,BYTE PTR [SI]

SUB AL,'0'

MOV M,EAX

;c = rem \* 100 + m

MOV EAX,100

MUL REM

MOV C,EAX

MOV EAX,M

ADD C,EAX

;

MOV X,0

MOV Y,0

;

While1:

MOV EAX,Y

CMP EAX,C ;while(y<c)

JAE AfterWhile

INC X ;x++

MOV EAX,20

MUL P ;20\*p

ADD EAX,X ;20\*p+x

MUL X

MOV Y,EAX ;y=x\*(20\*p+x)

JMP While1

AfterWhile:

; if(y>c)

MOV EAX,Y

CMP EAX,C

JBE SmallerThanC

DEC X ;x--

MOV EAX,20

MUL P ;20\*p

ADD EAX,X ;20\*p+x

MUL X

MOV Y,EAX ;y=x\*(20\*p+x)

SmallerThanC:

; putting X result in the result string

ADD X,'0'

LEA SI,result

ADD SI,RPOS

MOV AL,BYTE PTR X

SUB X,'0'

MOV [SI],AL

;

ADD SPOS,2 ;increase source string position

INC RPOS ;increase result string position

MOV EAX,C

SUB EAX,Y

MOV REM,EAX ;rem = c – y

MOV EAX,10

MUL P

ADD EAX,X

MOV P,EAX ;p = 10\*p + x

;

JMP EVEN1

PrintSolution:

;

MOV AH,9 ; Set print option for int 21h

MOV DX,OFFSET PrintSqrt ; Point display string to PrintSqrt

INT 21H ; Print chosen message

;

MOV AH,9 ; Set print option for int 21h

MOV DX, OFFSET PrintNum ; Point display string to PrintNum

INT 21H ; Print chosen message

;

MOV AH,9 ; Set print option for int 21h

MOV DX,OFFSET EndSqrt ; Point display string to EndSqrt

INT 21H ; Print chosen message

;

MOV AH,9 ; Set print option for int 21h

MOV DX,OFFSET result ; Point display string to result

INT 21H ; Print chosen message

;

MOV AH,4CH ; Set terminate option for int 21h

INT 21H ; Return to DOS (terminate program)

END MAIN

**פלטים:**















