



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Microprocessors and Interfacing

(CSE – 3002)

LAB EXPERIMENT- 5

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1. Write and execute ALP to prompt the user to input a string and print how many words in the entered string.

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Q1) ALP :

• model small

• stack 100h

• data

string db 100 dup(<?>)

msg1 db "Enter a string: \$"

msg2 db 0dh, 0ah, "No. of words in the
string: \$"

words dw 0

• code

main proc

mov ex, @data

mov ds, ax

mov es, ax

mov ah, 9

lea dx, string msg1

int 21h

lea di, string

mov ah, 1

read:

int 21h

cmp al, 0dh

je endofstring

stosb

jmp read

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end of string :

mov al, "\$"
stosb

xor bx, bx

count :

mov al, string[bx]

cmp al, "\$"

je exit

cmp al, " "

je word_completed

inc bx

jmp count

word_completed :

inc words

inc bx

jmp count

exit :

inc words

mov ah, 9

lee dx, msg2

int 21h

mov ah, 2

mov dx, words

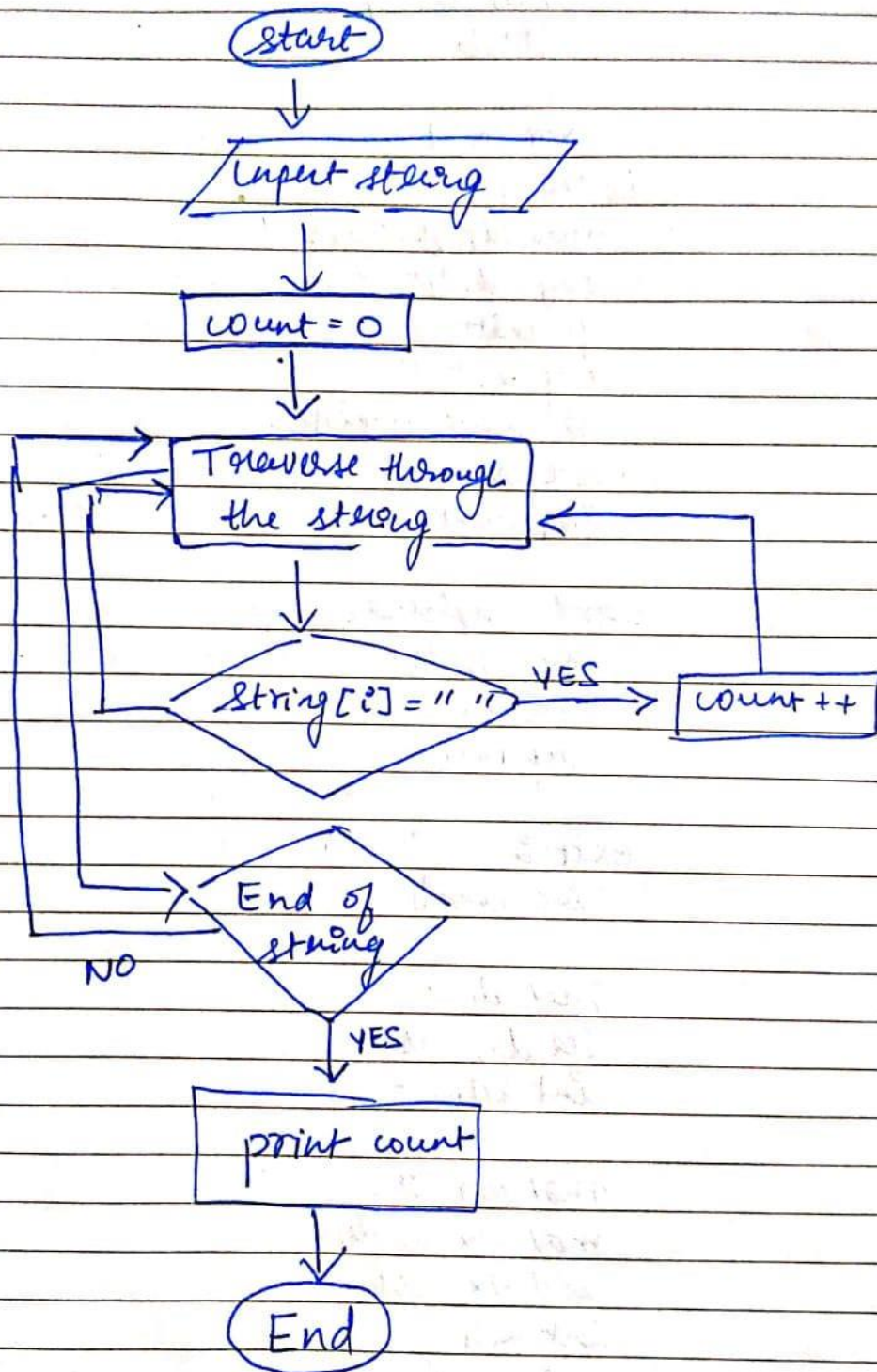
add dx, 30h

int 21h

main endp

end main

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2) Flowchart :

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3) Handwritten Calculations :

(i) Input : "This is a sentence"
output : 4

(ii) input : "I love football"
output : 3

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Screenshot of ALP:

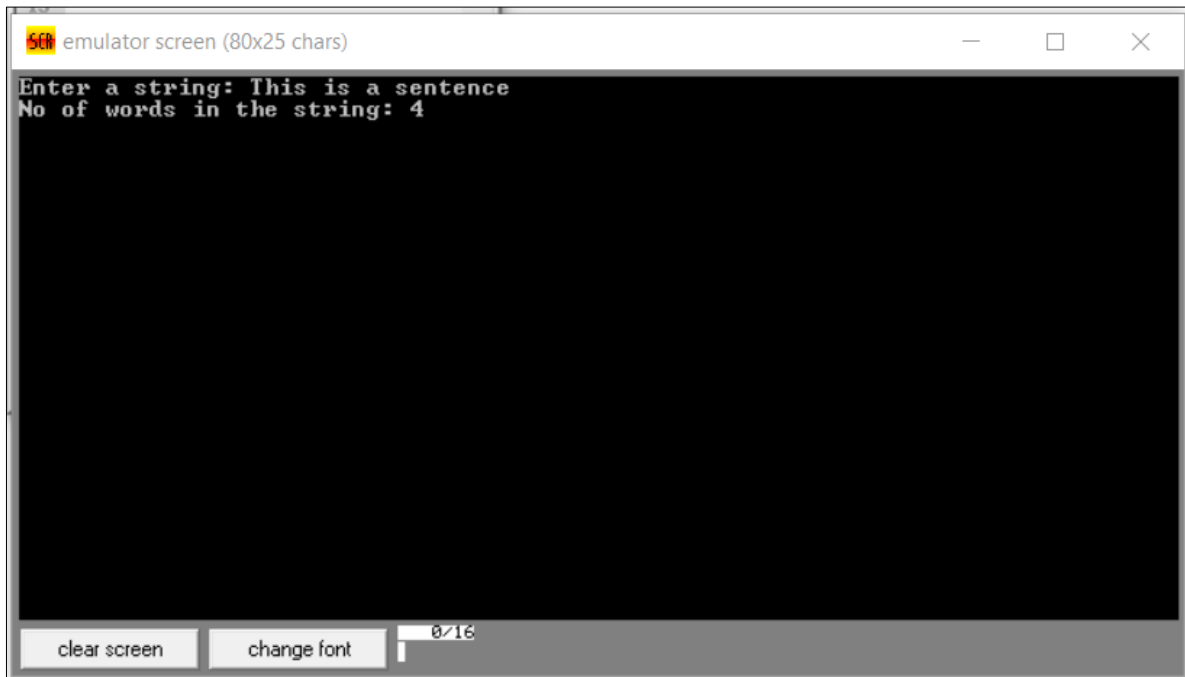
```

edit: C:\Users\Vibhu\OneDrive - vit.ac.in\Desktop\Fall Semester 21-22\Micro\ELA\LAB-5\no_of_words.asm
file edit bookmarks assembler emulator math ascii codes help
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01 .model small
02 .stack 100h
03 .data
04 string db 100 dup(?)
05 msg1 db "Enter a string: $"
06 msg2 db 0dh, 0ah, "No of words in the string: $"
07 words dw 0
08 .code
09 main proc
10
11     mov ax, @data
12     mov ds, ax
13     mov es, ax
14
15     mov ah, 9
16     lea dx, msg1
17     int 21h
18
19     lea di, string
20
21     mov ah, 1
22     read:
23     int 21h
24     cmp al, 0dh
25     je endofstring
26     stosb
27     jmp read
28
29     endofstring:
30     mov al, "$"
31     stosb
32
33     xor bx, bx
34
35     count:
36     mov al, string[bx]
37     cmp al, "$"
38     je exit
39     cmp al, " "
40     je word_completed
41     inc bx
42     jmp count
43
44     word_completed:
45     inc words
46     inc bx
47     jmp count
48
49     exit:
50     inc words
51
52     mov ah, 9
53     lea dx, msg2
54     int 21h
55
56     mov ah, 2
57     mov dx, words
58     add dx, 30h
59     int 21h

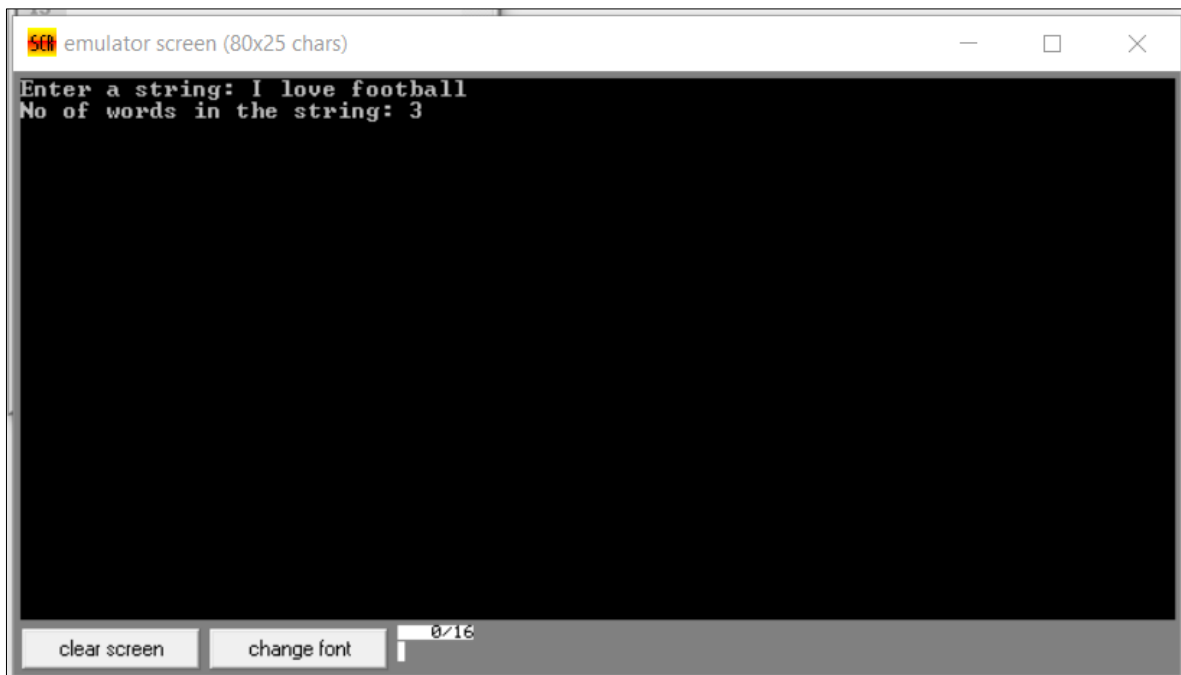
```

Screenshot of Output:

(i) Input: "This is a sentence"



(ii) Input: "I love football"



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2. Write and execute ALP to repeatedly prompt the user to enter 5 integers and display the Sum and Average of entered values.

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Q2) 1) ALP :

o model small

o data

val1 db ?

nl1 db 0ah, 0dh, 'Enter NO : ', '\$'

nl2 db 0ah, 0dh, 'Average : ', '\$'

nl3 db 0ah, 0dh, 'Sum : ', '\$'

o code

main proc

mov ax, @data

mov ds, ax

mov al, 05h

mov cl, al

mov bl, al

mov al, 00

mov val1, al

lbl1 :

lee dx, nl1

mov ah, 09h

int 21h

mov ah, 01h

int 21h

sub al, 30h

add al, val1

mov val1, al

loop lbl1

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l6l2 :

```
lea dx, n13
mov ah, 09h
int 21h
```

```
mov ax, 00
mov al, val1
add ax, 3030h
mov dx, ax
mov ah, 02h
int 21h
```

```
lea dx, n12
mov ah, 09h
int 21h
```

```
mov ax, 00
mov al, val1
div bl
add ax, 00
add al, val1
div bl
add ax, 3030h
mov dx, ax
```

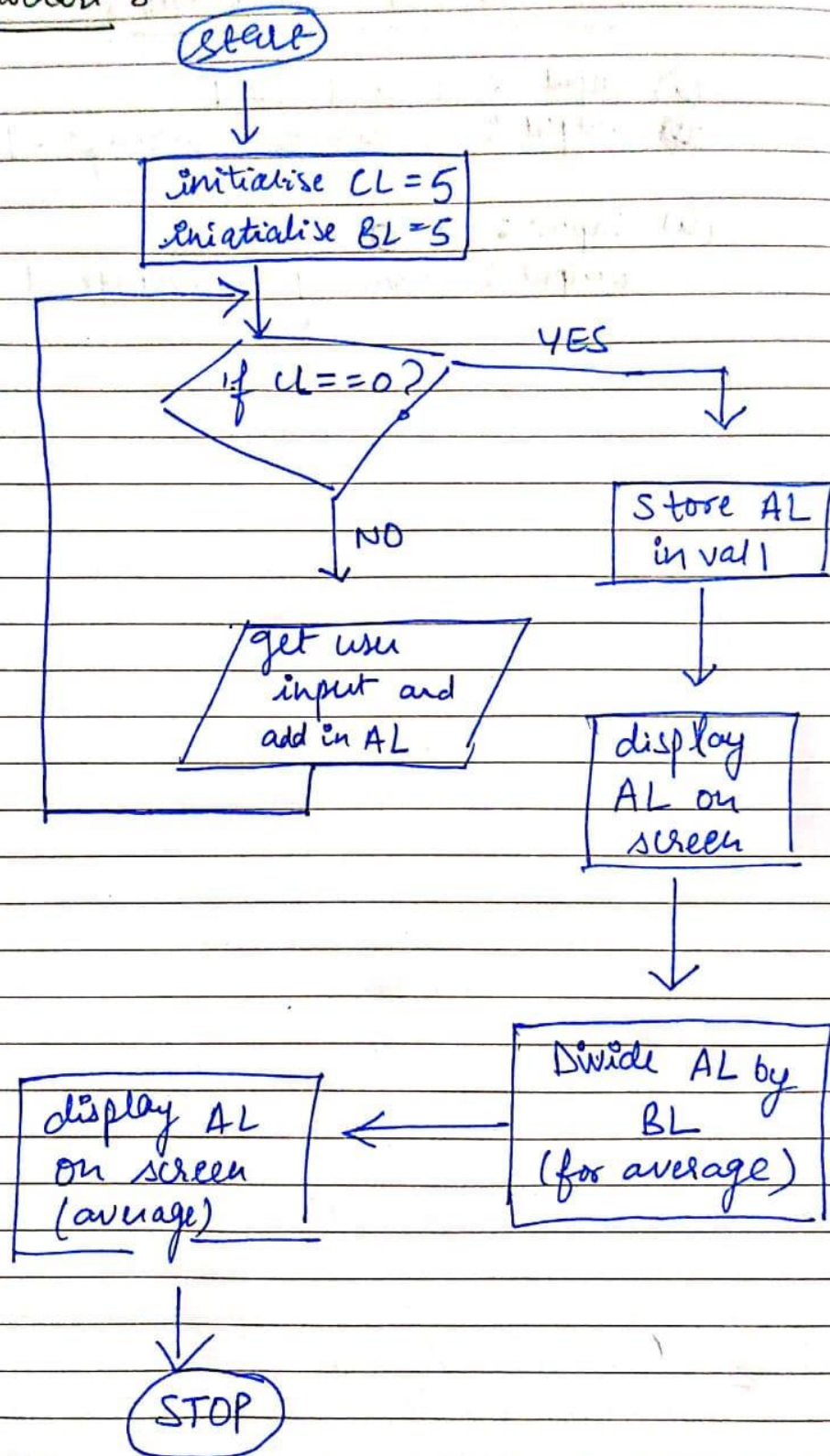
```
mov ah, 02h
int 21h
```

```
mov ah, 4ch
int 21h
```

```
main endp
end main
```

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2) Flowchart :

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3) Handwritten calculations :

(i) input : 1 0 1 2 1
 output : sum = 5 average = 1

(ii) input : 1 2 0 4 2
 output : sum = 9 average = 1 (1.8)

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Screenshot of ALP:

```

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01 .model small
02 .data
03     val1     db      ?
04     n11      db      0ah,0dh,'Enter No: ','$'
05     n12      db      0ah,0dh,'Average: ','$'
06     n13      db      0ah,0dh,'Sum: ','$'
07 .code
08 main
09     proc
10     mov ax,0data
11     mov ds,ax
12
13     mov al,05h
14     mov cl,al
15     mov bl,al
16     mov al,00
17     mov val1,al
18
19 lb11:
20     lea dx,n11
21     mov ah,09h
22     int 21h
23
24     mov ah,01h
25     int 21h
26     sub al,30h
27
28     add al,val1
29     mov val1,al
30     loop lb11
31
32 lb12:
33     lea dx,n13
34     mov ah,09h
35     int 21h
36
37     mov ax,00
38     mov al,val1
39     add ax,3030h
40     mov dx,ax
41     mov ah,02h
42     int 21h
43
44     lea dx,n12
45     mov ah,09h
46     int 21h
47
48     mov ax,00
49     mov al,val1
50     div bl
51     add ax,3030h
52     mov dx,ax
53     mov ah,02h
54     int 21h
55
56     mov ah,4ch
57     int 21h
58
59 main     endp
60         end      main
  
```

Screenshot of Output:

(i) Input: 1 0 1 2 1



(ii) Input: 1 2 0 4 2

