

COAL LAB MANUAL

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LAB 6

Task: Take a string from data segment and display vowels in it and count number of vowel in it and display count on screen

The description inside the “// ‘ ‘ // ” are the comments to make the code more clear. These are not the part of program.

```
// PROGRAM //
```

```
// Libraries to include //
```

```
.model
```

```
.stack
```

```
// DATA SEGMENT //
```

```
.data
```

```
str DB 'abcdeiighiklohoyekoe$'
```

```
counter DB 0
```

```
// CODE SEGMENT //
```

```
.CODE
```

```
// loads the starting address of string in BX register//
```

```
mov ax, @data
```

```
mov ds, ax
```

```
lea bx, str
```

mov dh, 0h

mov ah, 2h

mov CX, 40h

// LABEL I1 //

// Reads the string and jump on specific label //

I1:

mov al, [bx]

INC bx

CMP al, 'a'

JE I3

CMP al, 'e'

je I3

CMP al, 'i'

je I3

CMP al, 'o'

je I3

CMP al, 'u'

je I3

CMP al, '\$'

JE l4

JNE l1

// LABEL l3 //

// It prints a new line and the character in AL register on screen//

l3:

inc DH

mov CL, AL

mov DL, 0ah

int 21h

mov DL, 0dh

int 21h

mov DL, CL

int 21h

inc counter

jmp l1

// LABEL l4 //

**// prints number of vowels, count, on screen and then jumps on exit
label //**

l4:

```
mov dl, 0ah
int 21h
mov dl, 0dh
int 21h
mov al, 00h
mov ah, 00h
mov al, counter
mov bl, 10
div bl
mov bl, al
mov bh, ah
mov ah, 2
mov dl, bl
add dl, 30h
int 21h
mov dl, bh
add dl, 30h
int 21h
JMP exit
// LABEL exit //
```

exit:

.exit

// END//

Commands:

.model: it is used to tell the assembler that program is in protected mode.

.code: it contains all the codes and commands.

.data: it contains all the definitions and declarations of variables.

Labels: these are the customized names of specific code segment to call that code segment anywhere in program by its name

LABEL_NAME:

Write the code here.

MOV: Moves the contents of source instruction in destination and the syntax is as follows:

Mov Destination, Source

INT 21H: Call to DOS interrupt Handler.

INT 21H

INC : unary operator increment, used to add 1 in the contents of source.

INC Source

LEA: Load effective address of a memory block in a register it moves the starting address of a memory block in a register.

LEA Source, Destination

JMP: JMP command is used for unconditional jump on a label.

JMP LABEL_NAME

CMP: CMP is used to compare the contents of two register or variables and give a value in result if source is less than , greater than or equal to destination then -1, 1 or 0 is returned by CMP respectively.

CMP Source, Destination

JNE: in the result of CMP command this label will be executed if the contents of source and destination are not equal and by this we can jump on a label

JNE LABEL_NAME

JLE: In the result of CMP command this label will be executed if the contents of source is less or equal to destination by this we can jump on a label

JLE LABEL_NAME

JE: In the result of CMP command this label will be executed if the contents of source and destination are equal and by this we can jump on a label

JE LABEL_NAME

JL: In the result of CMP command this label will be executed if the contents of source is less than destination by this we can jump on a label

JL LABEL_NAME

JG: : In the result of CMP command this label will be executed if the contents of source is greater than destination by this we can jump on a label

JG LABEL_NAME

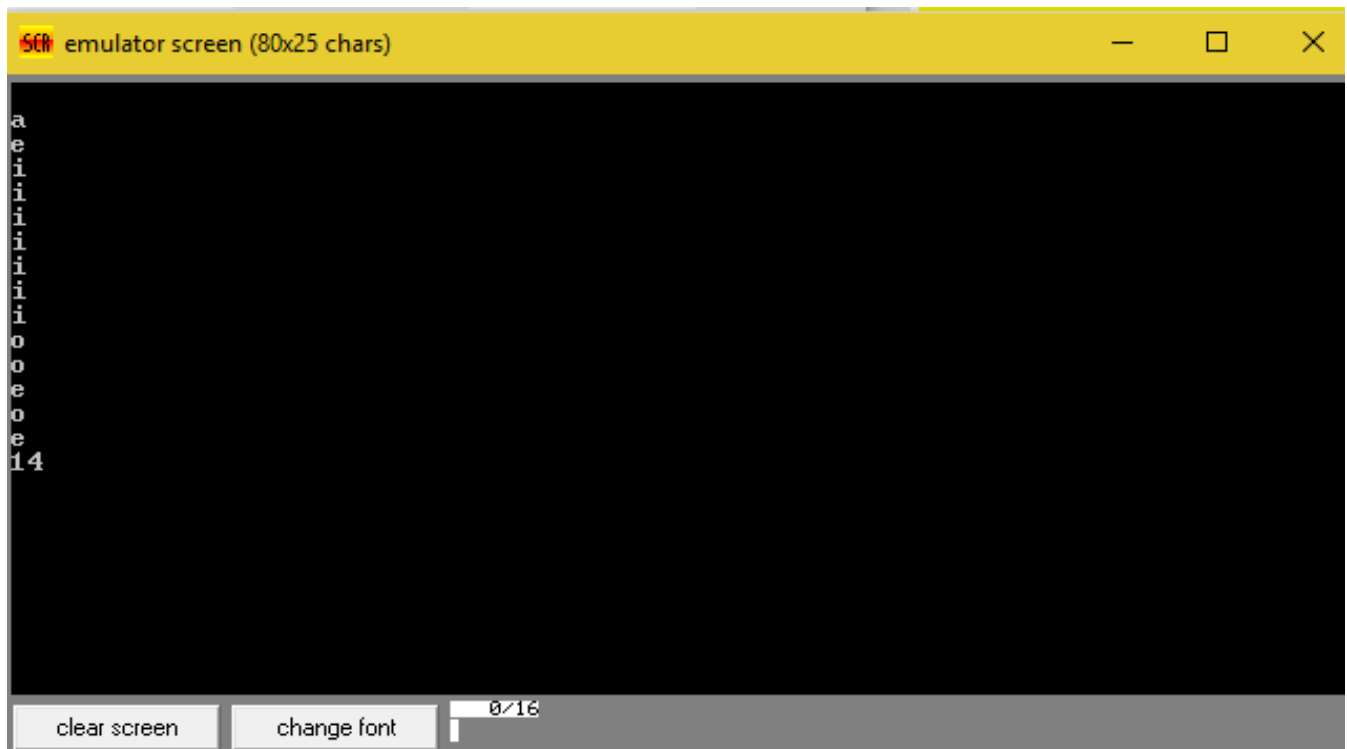
JGE: In the result of CMP command this label will be executed if the contents of source is greater or equal to destination by this we can jump on a label

JGE LABEL_NAME

.exit: Command to exit the program.

OUTPUT :

The following output screen will be displayed for 'abcdeiighiklohoeyekoe\$' string all the vowels in it are printed one by one and the number of vowels are also printed.



```
a
e
i
i
i
i
i
i
i
o
o
e
o
e
14
```

Description:

In this lab we have to take a string from data segment suppose str and read it character by character and print the vowels in it and count the number of vowels and print the count on screen. For this purpose I have used multiple labels and CMP statements to compare vowels and jump on different labels to display the vowel and increment the count and when the string is finished the count will be display to display the count we

have used div statement to get its quotient and remainder if it is a two digit number as shown in example string we divide it by 10 and then display the quotient and remainder on screen using div command we separate its parts and then print them one by one.