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Project Report

Computer Organization & Assembly Language

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Introduction:

The assembly language is a low-level programming language, which offers an efficient way for writing programs. Under the efficient, we assume that the programmer has a complete control over the code organization. This is possible because there is no compiler which translates and organizes the code. Thus, writing the program and the code organization is a full responsibility of the programmer. The programmer has access to each memory address and the full control of each byte in memory. This feature made assembly a very popular in writing fast interrupt procedures in the world of embedded systems over the years.

The project is about to take the string from the user & tells whether the string is EVEN or ODD and also tells about the index of the character which enter by the user.

Source Code:

```
.model small
.stack 100h
.data

string db 10 dup('$')
msg1 db 'Enter String: $'
msg2 db 'Maximum of length is Reached $'
msg3 db 'Enter a character to find $'
msgFound db 'Character is found at $'
msgNotFound db 'Character is not found $'
msgEven db 'Even $'
msgOdd db 'Odd $'


.code
main proc
mov ax, @data
mov ds, ax

mov bl, 1    ; counts the length of string

mov dx, offset msg1
mov ah, 9
int 21h

mov si, offset string
```

```
l1:
mov ah, 1
int 21h

cmp al, 13
je EnterKeyPressed

cmp bl, 10
je LengthReached

mov [si], al

inc si
inc bl
jmp l1

LengthReached:

call enterbutton
mov ah, 9
mov dx, offset msg2
int 21h

call enterbutton

mov dx, offset msgEven
mov ah, 9
int 21h

jmp AskCharacter

EnterKeyPressed:

call evenodd

jmp AskCharacter

AskCharacter:
call enterbutton
mov dx, offset msg3
mov ah, 9
```

```
int 21h

mov ah, 1
int 21h

mov bl, 1
mov si, offset string
l2:
cmp [si],al
je PrintFound

cmp bl, 10
je NotFound

inc bl
inc si
jmp l2

PrintFound:
call enterbutton
mov dx, offset msgFound
mov ah, 9
int 21h

mov dx, 0

mov dl, bl
add dl, 48
mov ah, 2
int 21h

call enterbutton

mov ah, 4ch
int 21h

NotFound:
call enterbutton
mov dx, offset msgNotFound
mov ah, 9
int 21h
```

```
mov ah, 4ch
int 21h

main endp

enterbutton proc
mov ah, 2
mov dl, 13
int 21h

mov ah, 2
mov dl, 10
int 21h

ret
enterbutton endp

evenodd proc
dec bl
mov ah, 0
mov al, bl
mov bl, 2

div bl

cmp ah,0

je IsEven

mov dx, offset msgOdd
mov ah, 9
int 21h

ret

IsEven:
mov dx, offset msgEven
mov ah, 9
int 21h
```

```
ret
evenodd endp
end main
```

Output:

```
C:\TASM>tasm project.asm
Turbo Assembler  Version 3.0  Copyright (c) 1988, 1991 Borland International

Assembling file:   project.asm
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  474k


C:\TASM>tlink project.obj
Turbo Link  Version 2.0  Copyright (c) 1987, 1988 Borland International

C:\TASM>project
Enter String: I am SMIU
Odd
Enter a character to find: S
Character is found at 6
```