



Green University of Bangladesh

Department of Computer Science and Engineering(CSE)

Faculty of Sciences and Engineering

Semester: (Fall, Year:2021), B.Sc. in CSE (Day)

LAB REPORT NO 2

Course Title: Microprocessors and Microcontrollers Lab

Course Code: CSE 304 Section: 193 DF

Lab Experiment Name: Take numbers as input from the user and print whether the given number is odd or even. You have to iterate the process until user press "N". If user press "N" terminate your program otherwise for given number print whether it is odd or even.

Student Details

Name		ID
1.	Md. Jakirul Islam	193002101

Submission Date : 15.12.2021

Course Teacher's Name : Md. Atikuzzaman

Lab Report Status

Marks:

Signature:.....

Comments:.....

Date:.....

TITLE OF THE LAB EXPERIMENT:

Take numbers as input from the user and print whether the given number is odd or even. You have to iterate the process until user press "N". If user press "N" terminate your program otherwise for given number print whether it is odd or even.

OBJECTIVES/AIM :

- The main objective of this topic is to implement basic conditional statements in assembly language.
- To gather knowledge how to use loop in assembly language.
- We will understand the use of jump condition in Assembly Language Program.
- To provide an introduction to syntax and structure of assembly language.

ANALYSIS :

A jump instruction, like "jmp", just switches the CPU to executing a different piece of code. It's the assembly equivalent of "goto", but unlike goto, jumps are not considered shameful in assembly.

Unconditional jump

This is performed by the JMP instruction. Conditional execution often involves a transfer of control to the address of an instruction that does not follow the currently executing instruction. Transfer of control may be forward, to execute a new set of instructions or backward, to re-execute the same steps. Loop is a sequence of statements that is repeated. This repetition of statements must be controlled by a specific condition otherwise the program will break down.

Conditional jump

This is performed by a set of jump instructions j<condition> depending upon the condition. The conditional instructions transfer the control by breaking the sequential flow and they do it by changing the offset value in IP. The LOOP instruction is a combination of a decrement of CX and a

conditional jump. In the 8086, LOOP decrements CX and if CX is not equal to zero, it jumps to the address indicated by the label. If CX becomes a 0, the next sequential instruction executes. Here CX is the count register which is used for executing repeating statements in assembly language.

Example:

```
;this is a comment  
  
;initialize count register CX to loop count.  
  
top:  
;body of the loop  
;Here goes your repeating statements.  
LOOP top ;Branch back to Label top
```

IMPLEMENTATION :

```
.model small  
.stack 100h  
  
.data  
even db "Number is Even $\n"  
odd db "Number is Odd $\n"  
press db "Terminate $\n"  
newLine db 10,13,"$\n"  
  
.code  
mov ax,@data  
mov ds,ax  
  
start:  
mov ah,01  
int 21h  
cmp al,78
```

je end

sub al,48

mov ah,0

mov bl,2

div bl

mov bh,ah

mov ah,09

lea dx,newline

int 21h

cmp bh,0

je divis

lea dx,odd

int 21h

lea dx,newline

int 21h

jmp start

divis:

lea dx,even

int 21h

mov ah,09

lea dx,newline

int 21h

```
jmp start
```

```
end:
```

```
mov ah,09
```

```
lea dx,newLine
```

```
int 21h
```

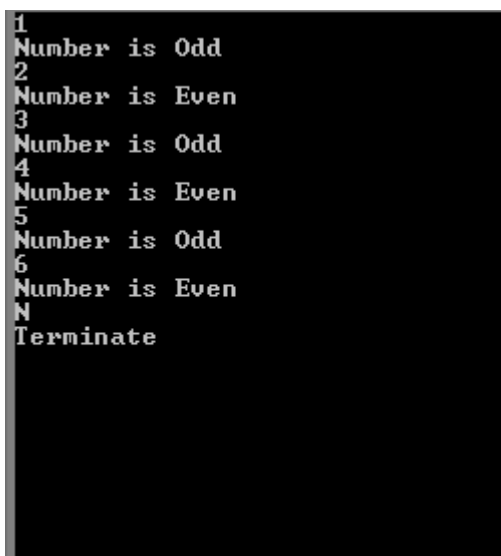
```
mov ah,09
```

```
lea dx,press
```

```
int 21h
```

```
ret
```

OUTPUT :



```
1
Number is Odd
2
Number is Even
3
Number is Odd
4
Number is Even
5
Number is Odd
6
Number is Even
N
Terminate
```

ANALYSIS AND DISCUSSION:

1. want to check whether a given number is odd or even, a simple test would be to check the least significant bit of the number. If this is 1, the number is odd, else the number is even.
2. f a number is evenly divisible by 2 with no remainder, then it is even. You can calculate the remainder with the modulo operator % like this `num % 2 == 0` .
3. If a number divided by 2 leaves a remainder of 1, then the number is odd. You can check for this using `num % 2 == 1` .
4. Assembly language is a low-level programming language for niche platforms such as IoTs, device drivers, and embedded systems. Usually, it's the sort of language that Computer Science students should cover in their coursework and rarely use in their future jobs.