Heaven's Light is Our Guide

Department of Electronics & Telecommunication Engineering
Rajshahi University of Engineering & Technology

Laboratory Report on

ETEXXXX (Sessional Based on ETEXXXX)

Submitted by

Mr. Xyz

Roll No. XXXXXX

Session: 20XX-XX

Submitted to

Mr. PQR

Assistant Professor

Department of Electronics & Telecommunication Engineering

Contents

Heaven's Light is Our Guide

Department of Electronics & Telecommunication Engineering
Rajshahi University of Engineering & Technology

Laboratory Report on

ETEXXXX (Sessional Based on ETEXXXX)

Experiment 1

Working with 8086 Assembly Language Programming

Submitted by:

Mr. Xyz

Roll No. XXXXXX

Session: 20XX-XX

Submitted to:

Mr. PQR

Assistant Professor

Dept. of ETE, RUET

Date of Experiment : 24/02/2024

Date of Submission : 28/02/2024

Report Writing

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor

(Teacher's Section)

Signature

Lab Viva

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor

1.1 Objectives

The main objectives of this experiment are

- To learn about how to take a single character input from a keyboard and display it.
- ...

1.2 Introduction

Write your introduction here.

1.3 Required Softwares

1. emu8086.

1.4 Problem A

Program to Take a Character Input from Keyboard and Display it at the Beginning of the Next Line.

1.4.1 Program

Program 1.1: Code for **Problem A**

```

.MODEL SMALL
.STACK 100H
.CODE
MAIN PROC
    MOV AH,1
    INT 21H
    MOV BL,AL

    MOV AH,2
    MOV DL,0DH
    INT 21H
    MOV DL,0AH
    INT 21H

    MOV DL,BL
    INT 21H

    MOV AH,4CH
    INT 21H
MAIN ENDP
 END MAIN
```

1.4.2 Output

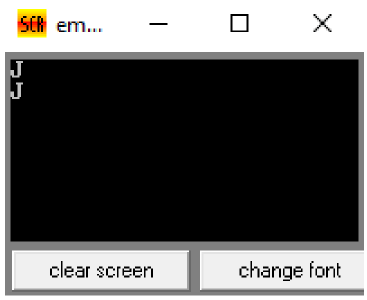

Fig 3.1: Output of Problem A .

1.5 Problem B

Program to Display a String Output.

1.5.1 Program

Program 1.2: Code for **Problem B**

```
.MODEL SMALL
.STACK 100H
.DATA
MSG DB 'JHALOK$'
.CODE
MAIN PROC


      MOV AX,@DATA
      MOV DS,AX

      LEA DX, MSG
      MOV AH, 9
      INT 21h

      MOV AH,4CH
      INT 21h
MAIN ENDP
END MAIN
```

1.5.2 Output

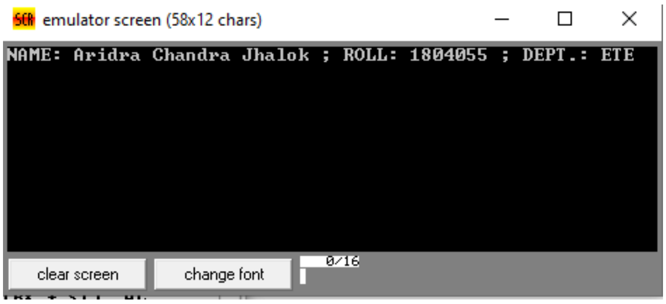

Fig 3.2: Output of Problem B .

1.6 Pasting Direct Code

Program 1.3: Sample 8086 assembly code

```
; This is a sample 8086 assembly code
.MODEL SMALL
.STACK 100H

.DATA
    msg DB 'Hello, world!', '$'

.CODE
main PROC
    MOV AX, @DATA
    MOV DS, AX

    MOV AH, 9
    MOV DX, OFFSET msg
    INT 21H

    MOV AH, 4CH
    INT 21H
main ENDP

END main
```

1.7 Conclusions and Discussions

Write your conclusions here.

Learn LaTeX

Click Here to learn LaTeX

or go to

`https://www.youtube.com/watch?v=Kxl1WS7SG7A&t=10s`

If you need any citations, then follow this:

An article [1]
A book [2]
A series [3]
Someone's thesis [4]
Some technical report [5]
A collection [6]
Visited website [7]
Accepted for publication [8]
Submitted for publication [9]
Not published [10]
Conversation [11]

References

[1] A. B. Cummings, D. Eftekhary, and F. G. House, "The accurate determination of college students' coefficients of friction," *Journal of Sketchy Physics*, vol. 13, no. 2, pp. 46–129, 2003.

[2] I. J. Kuss, *On the Importance of Kissing Up to Your Boss*, 5th ed. Cambridge MA: Dilbert Books, 1995.

[3] L. M. Napster, *Mathematical Theory of Efficient Piracy*, ser. Lecture Notes in Mathematics. New York NY: Springer Verlag, 1998, vol. 3204.

[4] O. P. Qwerty, "History of the goofy layout of keyboards," Ph.D. dissertation, Podunk IN, 1996.

[5] R. Swearingen, "Morpholoty and syntax of british sailors' english," New York NY, Tech. Rep., 1985.

[6] T. Upsilon, "Obscure greek letters and their meanings in mathematics and the sciences," in *Proceedings of the seventh international trivia conference*, V. W. Xavier, Ed. Philadelphia PA: Last Resort Publishers, 1987, pp. 129–158.

[7] J. Tetazoo, “A brief guide to recreational pyromania,” Available at http://www.blowinglotsofweirdstuffup.com/guide.html (2005/06/12).

[8] J. Mentor, “Behavior of small animals on fire,” (in press).

[9] ——, “Behavior of small animals on fire,” 2012, unpublished Manuscript.

[10] ——, “Behavior of small animals on fire,” 2012, unpublished Manuscript.

[11] S. Freud, Personal conversation, July 2012.

Heaven's Light is Our Guide

Department of Electronics & Telecommunication Engineering
Rajshahi University of Engineering & Technology

Laboratory Report on

ETEXXXX (Sessional Based on ETEXXXX)

Experiment 2

Verification of Ohm's Law

Submitted by:	***Submitted to:***
Mr. Xyz	Mr. PQR
Roll No. XXXXXX	Assistant Professor
Session: 20XX-XX	Dept. of ETE, RUET

Date of Experiment : 24/02/2024
Date of Submission : 28/02/2024

Report Writing	**(Teacher's Section)**	**Lab Viva**
☐ Excellent		☐ Excellent
☐ Good		☐ Good
☐ Average	____________________	☐ Average
☐ Poor	Signature	☐ Poor

2.1 Objectives

The main objectives of this experiment are

- To understand the importance and application of Ohm's Law
- To understand the application of Ohm's law to a variety of situations.
- To be able to plot Ohm's law (voltage versus current).

2.2 Theory

In 1826 George Simon Ohm stated a law as " the current in a metal conductor which is maintained at a constant temperature is proportional to the potential difference between the terminals." If the potential at point A (V_A) is greater than the potential at point B (V_B), then the potential difference between points A and B can be referred to as $V = V_{AB} = V_A - V_B$. Now, if the current flowing through the conductor is I, then according to Ohm's law, we have

$$\begin{aligned} I &\infty V \\ => I &= GV \\ => I &= \frac{V}{R}, \end{aligned} \tag{2.1}$$

where G is a proportional constant and is called the conductance of the conductor and $R = 1/G$, R is referred to as the resistance of the conductor. The final equation states a relation between the potential difference, current, and resistance. A complete mathematical statement of Ohm's law would be

$$R = \frac{V}{I} = K, \tag{2.2}$$

where K is a constant if the temperature remains constant.

2.3 Required Apparatus

1. Ammeter (1 pcs: 0-5A)
2. Voltmeter (1 pcs: 0-600V)
3. Resistor (2 pcs: 25Ω)

Figure 2.1: Current flowing through a conductor.

4. DC voltage source (0-100V)
5. Connecting wires

2.4 Circuit Diagram

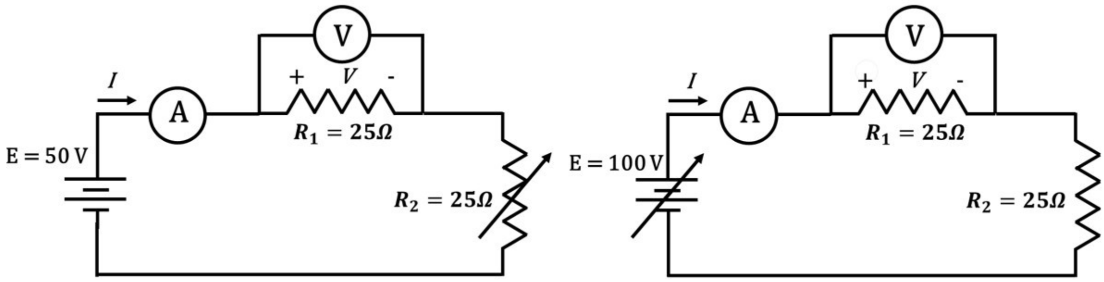

Figure 2.2: Circuit connection for verification of Ohm's law by varying (a) supply voltage and (b) variable resistance.

2.5 Procedure

2.5.1 Varying Supply Voltage

- The circuit was first connected similarly to fig. 2.2(a).
- Voltage source was then switched on and the readings of the ammeter and voltmeter were noted in Table 2.1.
- Next, the supply was disconnected, the value of supply voltage was changed, and the new readings of the ammeter and the voltmeter were taken and noted in Table 2.1.
- The process was repeated at least 5 times.
- The value of resistance was calculated from the values of the reading of the ammeter and the voltmeter using (2.2) and then compared with the test resistance.
- Finally, the values of the current and the voltage were plotted on graph paper.

2.5.2 Varying Variable Resistance

- The circuit was first connected similarly to fig. 2.2(b).
- Voltage source was then switched on and the readings of the ammeter and voltmeter were noted in Table 2.3.

- Next, the value of resistance was changed, and the new readings of the ammeter and the voltmeter were taken and noted in Table 2.3.
- The process was repeated at least 5 times.
- The value of resistance was calculated from the values of the reading of the ammeter and the voltmeter using (2.2) and then compared with the test resistance.
- Finally, the values of the current and the voltage were plotted on graph paper.

2.6 Data Table

Table 2.1: Verification of Ohm's law by varying supply voltage

SI No	Supply Voltage E (volt)	Current I (amp)	Voltage V (volt)	Resistance R_1 (Ω)	Resistance $R_{calc} = \frac{V}{I}$ (Ω)	Error $\%e = \frac{R_1 - R_{calc}}{R_1} \times 100\%$
01	30	0.60	14.8	25	24.67	
02	40	0.8	19.9	25	24.90	
03	50			25		
04	60			25		
05	70			25		
06						

Table 2.2: Verification of Ohm's law by varying resistance

SI No	Supply Voltage E (volt)	Current I (amp)	Voltage V (volt)	Resistance R_1 (Ω)	Resistance $R_{calc} = \frac{V}{I}$ (Ω)	Error $\%e = \frac{R_1 - R_{calc}}{R_1} \times 100\%$
01	30	0.60	14.8	25	24.67	
02	40	0.8	19.9	25	24.90	
03	50			25		
04	60			25		
05	70			25		
06						

2.7 Result

Table 2.3: GENERAL ELECTRIC
DIRECT CURRENT GENERATOR

KW 4	VOLTS 250	AMP 18
RPM 1450	WOUND COMP	
FLD AMPS 1.0 AS SH GEN	FLD OHMS 25C 152.8	
DUTY CONT 60 CRISE	E_NCL DP SERV FACT.1.15	
SUIT AS SHP	1500/3000 RPM 240V	
MOD 5CD256G317	SERXY1-1070	

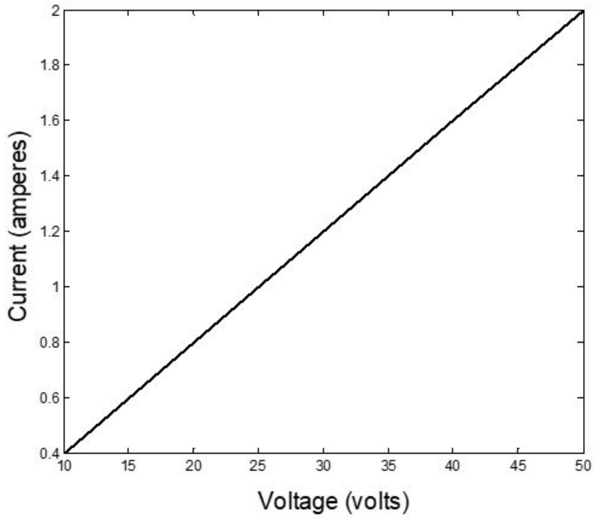

Figure 2.3: Plotting Ohm's law.

2.8 Conclusions and Discussions

Write down your discussions here.

Learn LaTeX

Click Here to learn LaTeX

or go to

`https://www.youtube.com/watch?v=Kxl1WS7SG7A&t=10s`

Heaven's Light is Our Guide

Department of Electronics & Telecommunication Engineering
Rajshahi University of Engineering & Technology

Laboratory Report on

ETEXXXX (Sessional Based on ETEXXXX)

Experiment 3

Working with Matlab Codes

Submitted by:

Mr. Xyz

Roll No. XXXXXX

Session: 20XX-XX

Submitted to:

Mr. PQR

Assistant Professor

Dept. of ETE, RUET

Date of Experiment : 24/02/2024

Date of Submission : 28/02/2024

Report Writing

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor

(Teacher's Section)

Signature

Lab Viva

- ☐ Excellent
- ☐ Good
- ☐ Average
- ☐ Poor

3.1 MATLAB Code A

Program 3.1: Sample MATLAB code

```
% This is a sample MATLAB code
A = [1, 2, 3; 4, 5, 6; 7, 8, 9];
b = [10; 11; 12];
x = A \ b;
disp(x);
```

3.2 MATLAB Code B

Program 3.2: Code for Problem B

```
clc
clear
fx=@(x) x^2-4*x-10;
a=input('a= ');
b=input('b= ');
e=input('e=');
n=input('n= ');
fa=fx(a);
fb=fx(b);
if fa*fb>0
    break
end
c(1)=(a+b)/2;
for k=1:n
    A(k)=a;
    B(k)=b;
    K(k)=k;
    f(k)=fx(c(k));
    if f(k)*fb<0
        a=c(k);
    else
        b=c(k);
    end
    c(k+1)=(a+b)/2;
    s=abs(c(k+1)-c(k));
    if s<=e
```

```
        break;
    end
end
disp('     k          a          b          a+b/2      f(x)')
Z=[         K'         A'         B'        c(1:k)'     f'   ];
disp(Z);
Root= c(k)
```

Learn LaTeX

Click Here to learn LaTeX

or go to

https://www.youtube.com/watch?v=Kxl1WS7SG7A&t=10s

Heaven's Light is Our Guide

Department of Electronics & Telecommunication Engineering
Rajshahi University of Engineering & Technology

Laboratory Report on

ETEXXXX (Sessional Based on ETEXXXX)

Experiment 4

Working with Python Codes

Submitted by:
Mr. Xyz
Roll No. XXXXXX
Session: 20XX-XX

Submitted to:
Mr. PQR
Assistant Professor
Dept. of ETE, RUET

Date of Experiment : 24/02/2024
Date of Submission : 28/02/2024

Report Writing	**(Teacher's Section)**	**Lab Viva**
☐ Excellent		☐ Excellent
☐ Good		☐ Good
☐ Average		☐ Average
☐ Poor	Signature	☐ Poor

4.1 Python Code

Program 4.1: Sample Python code

```
# This is a sample Python code
def hello_world():
    print("Hello, world!")

hello_world()
```

4.2 Python Code B

Program 4.2: Code for Problem B

```
# -*- coding: utf-8 -*-
"""
Created on Tue Mar 22 16:19:50 2022

@author: Arif
"""

#Import libraries as necessary
import math
import numpy as np
#import xlwt
from xlwt import Workbook

#Take necessary input
#For bisection, two input is required to bracket the root
xl=float(input ('Enter 1st initial value: '))   #1st input
print(xl)
xu=float(input ('Enter 2nd initial value: '))   #2nd input

#computing function values corresponding to initial values
fxl=(667.38/xl)*(1-math.exp(-0.146843*xl))-40
fxu=(667.38/xu)*(1-math.exp(-0.146843*xu))-40

#checking initial input values
if fxl*fxu>0:
        print('Wrong initial input')
```

```
#if the initial input is correct
elif fxl*fxu<0:
    #taking input
    err=float(input('Enter desired percentage relative error: '))
    ite=int(input('Enter number of iterations: '))
    #initialization
    x_l=np.zeros([ite])
    x_u=np.zeros([ite])
    x_c=np.zeros([ite])

    f_xl=np.zeros([ite])
    f_xu=np.zeros([ite])
    f_xc=np.zeros([ite])

    rel_err=np.zeros([ite])
    itern=np.zeros([ite])
    #storing initial computed values into array
    x_l[0]=xl
    x_u[0]=xu

    f_xl[0]=fxl
    f_xu[0]=fxu
    #begin iteration
    for i in range(ite):
        #storing the values of iteration
        itern[i]=i+1
        #Bisection Formula
        x_c[i]=(x_l[i]+x_u[i])/2

        f_xl[i]=(667.38/x_l[i])*(1-math.exp(-0.146843*x_l[i]))-40
        f_xu[i]=(667.38/x_u[i])*(1-math.exp(-0.146843*x_u[i]))-40
        f_xc[i]=(667.38/x_c[i])*(1-math.exp(-0.146843*x_c[i]))-40
        #calculating error
        if i>0:
```

```
            rel_err[i]=((x_c[i]-x_c[i-1])/x_c[i])*100
        #terminate if error criteria meets
        if all ([i>0, abs(rel_err[i])<err]):
            break
        elif f_xc[i]==0:
            break

        if i==ite-1:
            break
        #replacement of the new estimate
        if all ([f_xc[i]>0, f_xl[i]>0]):
            x_l[i+1]=x_c[i]
            x_u[i+1]=x_u[i]
        elif all ([f_xc[i]>0, f_xu[i]>0]):
            x_u[i+1]=x_c[i]
            x_l[i+1]=x_l[i]
        elif all ([f_xc[i]<0, f_xl[i]<0]):
            x_l[i+1]=x_c[i]
            x_u[i+1]=x_u[i]
        elif all ([f_xc[i]<0, f_xu[i]<0]):
            x_u[i+1]=x_c[i]
            x_l[i+1]=x_l[i]

    #Writing the results on an excel sheet
    #Workbook is created
    wb = Workbook()

    # add_sheet is used to create sheet.
    sheet1 = wb.add_sheet('Sheet 1')
    num_of_iter=i

    #writing on excel
    #sheet1.write(0,2,'The')
    sheet1.write(0,3,'Bisection')
    sheet1.write(0,4,'Method')
    #sheet1.write(0,5,x_c[i])

    sheet1.write(1,0,'Number of iteration')
```

```python
    sheet1.write(1,1,'x_l')
    sheet1.write(1,2,'x_u')
    sheet1.write(1,3,'f(x_l)')
    sheet1.write(1,4,'f(x_u)')
    sheet1.write(1,5,'x_c')
    sheet1.write(1,6,'f(x_c)')
    sheet1.write(1,7,'Relative error')

    #writing values on excel
    for n in range(num_of_iter+1):

        sheet1.write(n+2,0,itern[n])
        sheet1.write(n+2,1,x_l[n])
        sheet1.write(n+2,2,x_u[n])
        sheet1.write(n+2,3,f_xl[n])
        sheet1.write(n+2,4,f_xu[n])
        sheet1.write(n+2,5,x_c[n])
        sheet1.write(n+2,6,f_xc[n])
        sheet1.write(n+2,7,rel_err[n])

    sheet1.write(n+4,2,'The')
    sheet1.write(n+4,3,'root')
    sheet1.write(n+4,4,'is')
    sheet1.write(n+4,5,x_c[i])

    #save the excel file
    wb.save('bisection.xls')
```

Learn LaTeX

Click Here to learn LaTeX

or go to

https://www.youtube.com/watch?v=Kxl1WS7SG7A&t=10s