

**DESIGN OF A SIMPLE STUDENTS' RESOURCE  
CENTER CONSISTING OF FUNCTIONAL  
WEBPAGES USING JAVASCRIPT  
PROGRAMMING**

**BY**

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**NOVEMBER 2004**

## **DECLARATION**

This is to certify that the lines of JavaScript and HTML codes and the design were written and carried out respectively by me. This is in partial fulfillment for the award of B. Eng in the department of Electrical/Computer Engineering.

## CERTIFICATION

This is to certify that this thesis "The Design of a Resource Center Consisting of JavaScript Enabled Functional WebPages" is the original work of **Abdulsalam Mamman Nasir (10643/EE)** carried out under my supervision. I found the work adequate both in scope and quality for the partial fulfillment of the requirement for the award of Bachelor of Engineering (B.Eng) in Electrical/Computer engineering.

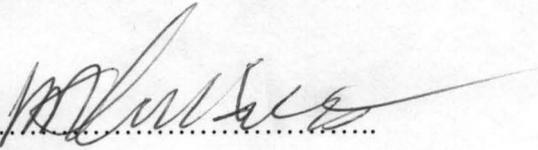


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Date

Head of Department

External Examiner

Date

## **DEDICATION**

This thesis is dedicated to my parents. First to my father, Mallam Salihu Omar Abdulsalam who made a lot of sacrifices for the sake of our education. Secondly, to my mother, Hajia Risikat Titilola Abdulsalam for her faith, prayers and understanding.

## ACKNOWLEDGEMENT

I acknowledge ALLAH's mercy without which this write-up wouldn't have been possible. My profound gratitude however goes to my project supervisor Mr. Abraham.U. Usman who took the pains to read through every bit of the write-up, offering very useful advices and putting me back on track when I derail. Also many thanks to Mr.. Ajiboye and Mr. Umar Dauda for their immense contributions.

I will also like to thank the management and staff of Geoquest and DCS, Schlumberger Nigeria Limited, Portharcourt for giving me the opportunity to undertake my internship which lasted a whole year and from whom I learnt a great deal on programming, softwares and Exploration & production.

This acknowledgement will not be complete without recognizing the support of my siblings, Balkisu Abdulsalam, Zainab Abdulsalam and Biliaminu Abdulsalam. Also that of my cousins too numerous to mention. To my aunts, Mrs Fati Usman Abubakar, Mrs Bola Esho and my grandmother, Hajia Zeenat for taking very good care of me in Minna And Portharcourt. Finally, to my friends and colleagues at school whom I would have mentioned one after the other but for space, I say to them thank you for everything and Allah's blessing to all of you.

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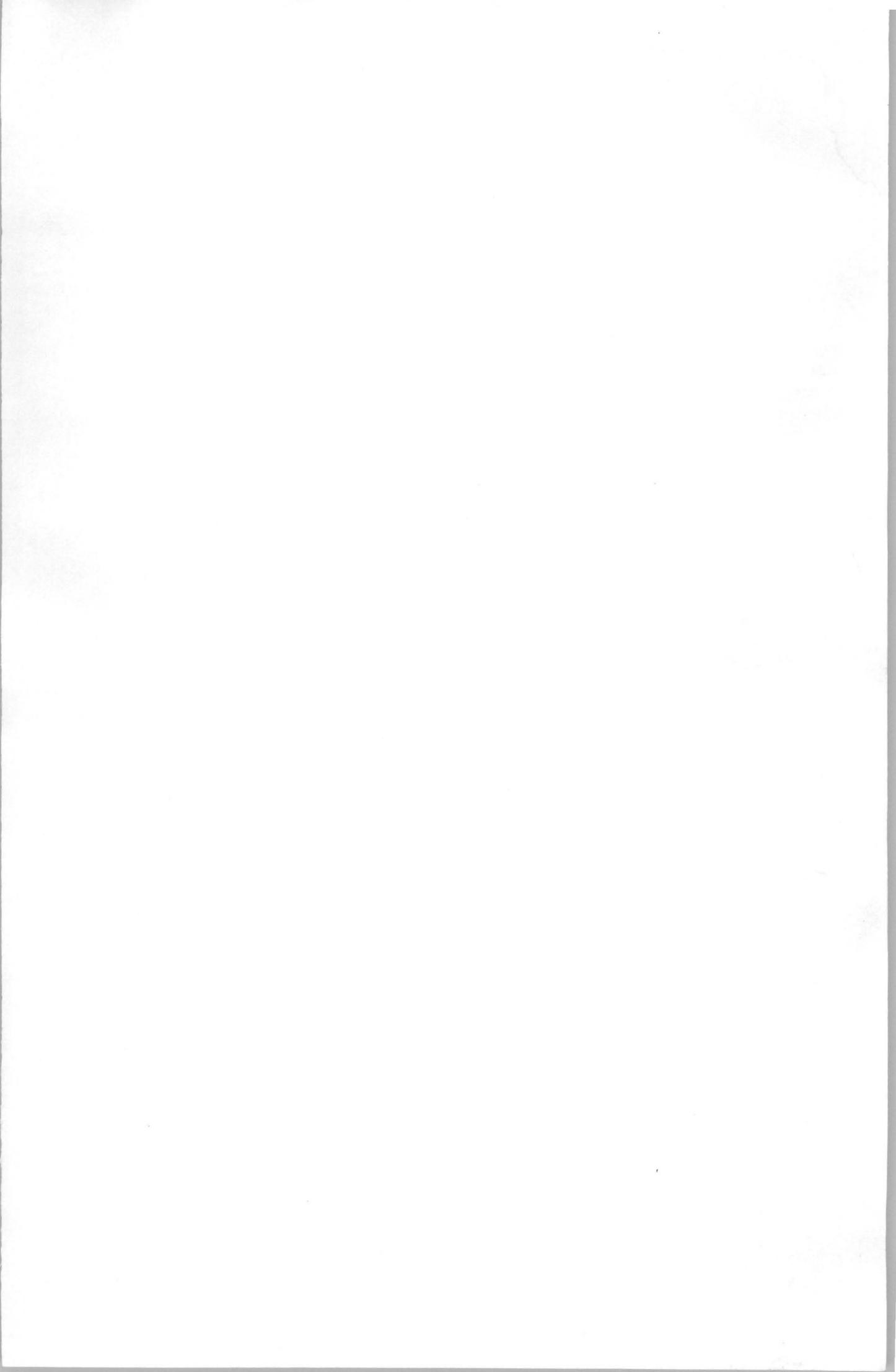
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## **ABSTRACT**

Until the advent of computers and other electronic methods of accessing and obtaining information, a resource center could have been thought of as a physical structure (a building) with relevant information libraries and perhaps, personnel (resource persons). But now, the scope could conveniently be expanded to include electronic methods of obtaining this information or reaching the resource persons. Therefore if the real (physical) object is on the table, why not have the virtual (electronic) copy on the desktop.



# CHAPTER ONE

## 1.0 GENERAL INTRODUCTION

The internet can best be described as a huge electronic library of information. It is an interconnection of computers worldwide. Opening and viewing web pages on the internet requires software applications known as Internet browsers. They are also known as web browsers or simply as browsers. Browsers are used for opening and viewing web pages presented in HTML format or any other presentation format such as XML and WITSML. Example of browsers include INTERNET EXPLORER (developed by Microsoft corporation) and NETSCAPE NAVIGATOR (developed by Netscape Corporation) to mention a few. Browsers, in addition to providing HTML documents to the viewer, also run javascript codes or codes written in javascript programming language.

### 1.0.1 INTRODUCTION TO HTML

HTML stands for Hyper Text Mark-up Language. It is a presentation format or language for documents or files on the web. HTML was invented by Tim Berners-Lee while at CERN, the European laboratory for particle physics in Geneva. HTML is an example of (or a branch of) SGML DTD where SGML means Standard Generalized Mark-up Language and DTD, Document Type Definition. Hence HTML is a formal specification of a mark-up language using SGML. Another example is Extensible Mark-up language (XML). HTML documents are plain text (also known as ASCII) files that can be created using any text editor (e.g. Notepad on a windows machine, vi editor on a UNIX machine and SimpleText on a Macintosh). HTML codes consist of "elements"

contained in "tags". An element is the fundamental component of the structure of a text document. Examples of elements are heads, titles, paragraphs, tables, lists etc. Elements can contain plain text, other elements or both. A tag is used to denote various elements in a HTML document. HTML tags consist of a left angle bracket (<), a tag name and a right angle bracket (>). Tags are usually paired e.g <H1> and </H1> or <head> and </head>. The first tag( one without a slash) is for starting a tag instruction while the other (one with a slash "/") is for ending a tag instruction. Some elements may include an attribute, which is additional information that is included inside the start tag. For example, <body background ="nasir.gif" bgcolor=000fff>. This tag which is an opening tag, describes the background image and colour to be used in the body section of the HTML document. HTML is not case sensitive, hence, <title> is the same as <TITLE>. Because the characters "<", ">", and "&" have special meanings in HTML, their escape sequences are used if they must appear on the document. The escape sequences are "&lt;" for "<", "&gt;" for ">" and "&amp;" for "&". Escape sequences are however case sensitive. In HTML, not all tags are supported by all browsers. If a browser does not support a tag, it will simply ignore it. Hence this property of HTML is used in commenting. The "<" and ">" characters can be used for comments by simply putting the text that makes up the comment in between them. The browser then sees the whole block of comment as one tag which it ignores. Every HTML document should contain certain standard HTML tags. Each document consists of a head and body. The head contains the title and the body contains the actual text that is made up of paragraphs, lists, and other elements. A minimal HTML document is given below.

```

<html>
<head>
<title>Calculator For Grade Point Average (GPA)</title>
</head>
<body>
<H1>This page will enable the student calculate his CGPA</H1>
<p>The student is to provide the data by entering in to the given fields, his course codes
and their equivalent credit worth and his grades. The student will then click on the
“Calculate GPA” button.
</p>
</body>
</html>

```

A non exhaustive list of HTML tags and their meanings is given below.

Tag	Meaning
<H1>, <H2>,..... <H6>	Headings
<p>	paragraph
<li>	Actual lists
<ul>	unordered lists
<ol>	ordered/numbered lists
<dl>	definition lists
<pre>	preformatted text

 	forced line breaks
<hr>	horizontal rule
<b>	bold text
<i>	Italics text

## 1.0.2 INTRODUCTION TO JAVASCRIPT PROGRAMMING

Although HTML is used to display text and images on the web in a predetermined form, that is about all that HTML can do. But with the use of JavaScript however, a page can be made to be functional. In other words, a little or lot of programming can be done on an otherwise purely HTML page. JavaScript is a full programming language that was developed by Netscape Corporation. It is designed to work with HTML and be run with a browser. Because it is a full programming language, it understands and works with the following concepts;

- ◆ Data formats
- ◆ Stringed or ASCII data
- ◆ Numerical data (integer)
- ◆ Numerical data (with decimals and standard form)
- ◆ Variables and their declaration
- ◆ Arrays (particularly useful when dealing with matrices and simultaneous equations)
- ◆ Operators

1. Assignment operator
2. Relational operator
3. Arithmetic operator

- ◆ A method of inputting data and outputting data ( Keyboard and monitor)
- ◆ The different loop structures
- ◆ Functions and how to call them
- ◆ Comments

Javascript also understand concepts such as windows, documents and forms as a result of its use on webpages. Because javascript works hand-in-hand with HTML, it also uses tags to introduce itself. The opening tag is `<script language="javascript">` and the closing tag is `</script>`. Any line of code that is part of javascript programming must appear between these two tags, otherwise, it will just appear as HTML. Javascript can go into the header section (between tags `</title>` and `</head>` or anywhere in the body section of the HTML document. To insert comments in javascript, the double slash `“//”` and the slash/star arrangement `“/*.....*/”` is used. The double slash characters are used in front of a line when the entire line is a comment. The slash/star arrangement is used to enclose a block of text consisting of several lines, as a comment. One of the great things about javascript is that you can do a great deal with little programming. Its best advantage is it's simplicity. No fancy computer is needed. No other software apart from a text editor and a browser and these two softwares are almost always available on a personal computer that has an operating system and is also configured for possible internet connection. A typical example of the functionality of javascript is that you can

have the current date always displayed for the person opening and viewing the HTML page.

## **1.1 LITERATURE REVIEW**

### **1.1.1 RESISTOR COLOUR CODING**

A resistor is any device or component that is capable of opposing the flow of current. In other words, it limits the flow of current; hence it has an ohmic value also known as resistance (measured in ohms). Of course, when a substance has high resistance, it will allow very little current to pass through itself and vice versa. In circuit designs, resistors are used to give a certain voltage drop or to limit the amount of voltage entering the circuit. Hence, predetermined values of resistances are always required. There are many ways of representing or coding resistors that have prefixed values, one of which is the colour coding. In colour coding, a resistor is coded with four or five colours. In the Four-Colour-code resistors, three of the colours are closely spaced on one side of the resistor while the fourth colour is on the other side. The fourth colour is known as the tolerance colour. In the Five-colour-code resistors, four colours are closely spaced and the fifth colour is the tolerance colour. Tolerance can only have the following colours and equivalent tolerance values

Gold	$\pm 5\%$
Silver	$\pm 10\%$
None	$\pm 20\%$

The five colour code resistors have the following additional tolerance colours

Brown  $\pm 1\%$

Red  $\pm 2\%$

The first and second colours form a tens and ones arrangement while the third colour is known as the multiplier colour. In the five-colour-code resistor, the first, second, and third colours form a hundreds, tens and ones arrangement, while the fourth colour is the multiplier. Nominal values of each colour are given below;

Black(0), brown(1), red(2), orange(3), yellow(4), green(5), blue(6), violet(7), gray(8), white(9). Additionally, multipliers have gold (-1) and silver (-2).

Therefore a resistor that has the first three colours all white and the fourth colour silver will have a resistance of  $99 * 10^9$  ohms or (99Giga ohms) with a tolerance of  $\pm 20\%$  giving a range of 79.2 Gig ohms to 118.8 Gig ohms.

### 1.1.2 CALCULATION OF GPA

The GPA calculator could either be the Semester Grade Point Average Calculator (SGPA) or the Cumulative Grade Point Average Calculator (CGPA). First of all, standard grades and their equivalent points must be known. Secondly, the credit worth of each course is also known prior to computation. In whichever case a Grade Point (GP) is arrived at based on the students' grades and the equivalent Credit Taken (CT) is computed. The GPA is then given by

$$\text{GPA} = \text{GP} / \text{CT}$$

$$\text{So in semester terms } \text{SGPA} = \text{SGP} / \text{SCT}$$

$$\text{And in Cumulative terms } \text{CGPA} = \text{CGP} / \text{TCT}$$

Where SGP is Semester Grade Point

SCT is Semester Credit Taken

CGP is Cumulative Grade Point

TCT is Total Credit Taken (also known as CCT)

If a star “\*” is used to denote previous values, then

$$CGPA = CGP / TCT = (CGP^* + SGP) / (TCT^* + SCT)$$

The standard grades used by FUT Minna and their equivalent points are given below.

A	5 points
B	4 points
C	3 points
D	2 points
E	1 point
F	0 points

The credit worth of a course must be a positive (non zero) number. In FUT Minna, Integral values are used (e.g 1, 2, 3, 4, 8.....)

If  $X_i$  denotes the point scored in the  $i$ th course of a semester and  $D_i$  denotes the credit worth of the  $i$ th course, then for  $n$  courses

$$SGP = \sum (X_i * D_i) \text{ And } SCT = \sum D_i, i = 1, 2, 3, \dots, n \text{ where } \sum \text{ means summation}$$

And for  $m$  semesters  $CGP = \sum SGP_k$  And  $TCT = \sum SCT_k$  for  $k = 1, 2, \dots, m$  Where

$SGP_k$  is the semester grade point for the  $K$ th semester

### 1.1.3 GENERAL QUADRATIC EQUATION

The quadratic equation is an equation in which the highest power of the unknown is 2. A

quadratic expression looks like this  $X^2 + X + 4$

The general quadratic equation is given as

$$AX^2 + BX + C = 0$$

The roots of this equation are the values of the Unknown (X) for which the equation evaluates to a value of zero (0) and these values are

$$X_1 = \frac{-B + (B^2 - 4AC)^{1/2}}{2A}$$

$$X_2 = \frac{-B - (B^2 - 4AC)^{1/2}}{2A}$$

If  $B^2 = 4AC$  then  $X_1 = X_2$ , then the roots are real and equal

If  $B^2 > 4AC$ , then the roots are real and distinct

If  $B^2 < 4AC$ , then the roots are complex conjugates of each other

The gradient of the graph given by the quadratic equation above and hence the differential is  $2AX + B$

The turning point of the graph occurs when  $2AX + B = 0$

Or when  $X = -B / 2A$

It is a minimum point when  $2A > 0$  and a maximum point when  $2A < 0$

#### **1.1.4 PROJECT AIMS AND OBJECTIVES**

This project seeks to make available to students, pages that are of resourceful use. The project is a collection of webpages, each of which performs a particularly useful function where the student is concerned. The project also seeks to introduce javascript programming as a powerful tool for creating dynamic HTML documents and to recommend javascript as a very good introductory programming language. The project consists of

- ♦ A javascript SGPA/CGPA calculator
- ♦ A javascript resistance calculator, based on four and five colour codes
- ♦ A javascript quadratic calculator and analyzer.

Each of these pages does exactly what it says.

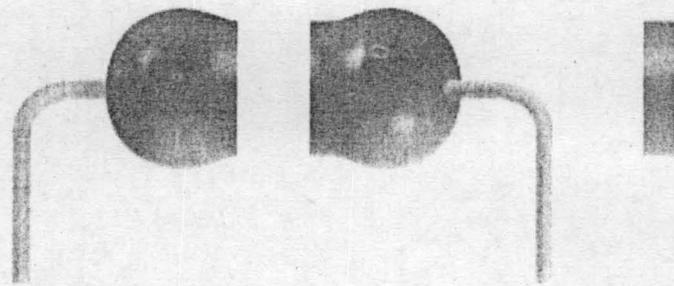
#### **1.1.5 PROJECT OUTLINE/LAYOUT**

It is not intended to restrict the objective of this project to the three pages mentioned above. The project is designed in such a way that more pages will be added subsequently until such a time that a large collection of webpages that results in a vast resource library, is created. On this end, there would be a homepage which will be the default page. The homepage will contain links to all other pages. All the pages (including the homepage) will however be in one folder. As a result, navigation between pages will be in relative (and not absolute) terms. Pictures and graphics used throughout the project were created using an image creation and editing software such as COREL DRAW. Pictures and graphics for a particular page were saved in a folder and this folder itself, kept in the same directory as the webpages.

## CHAPTER TWO

### 2.0 RESISTOR COLOUR CODE PAGE

For the design of the resistor, several images were needed out of which seven will represent a particular resistance value. The images created consist of three constants and thirteen variable images. The three constant images are



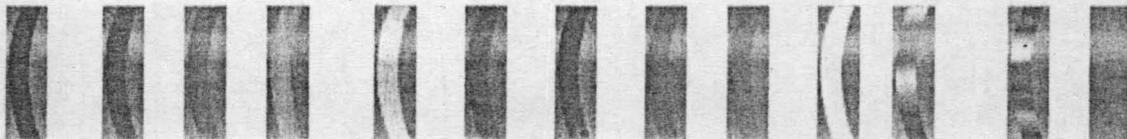
Left Handle

Right Handle

Spacer

FIG 2.1

While the thirteen variable images are



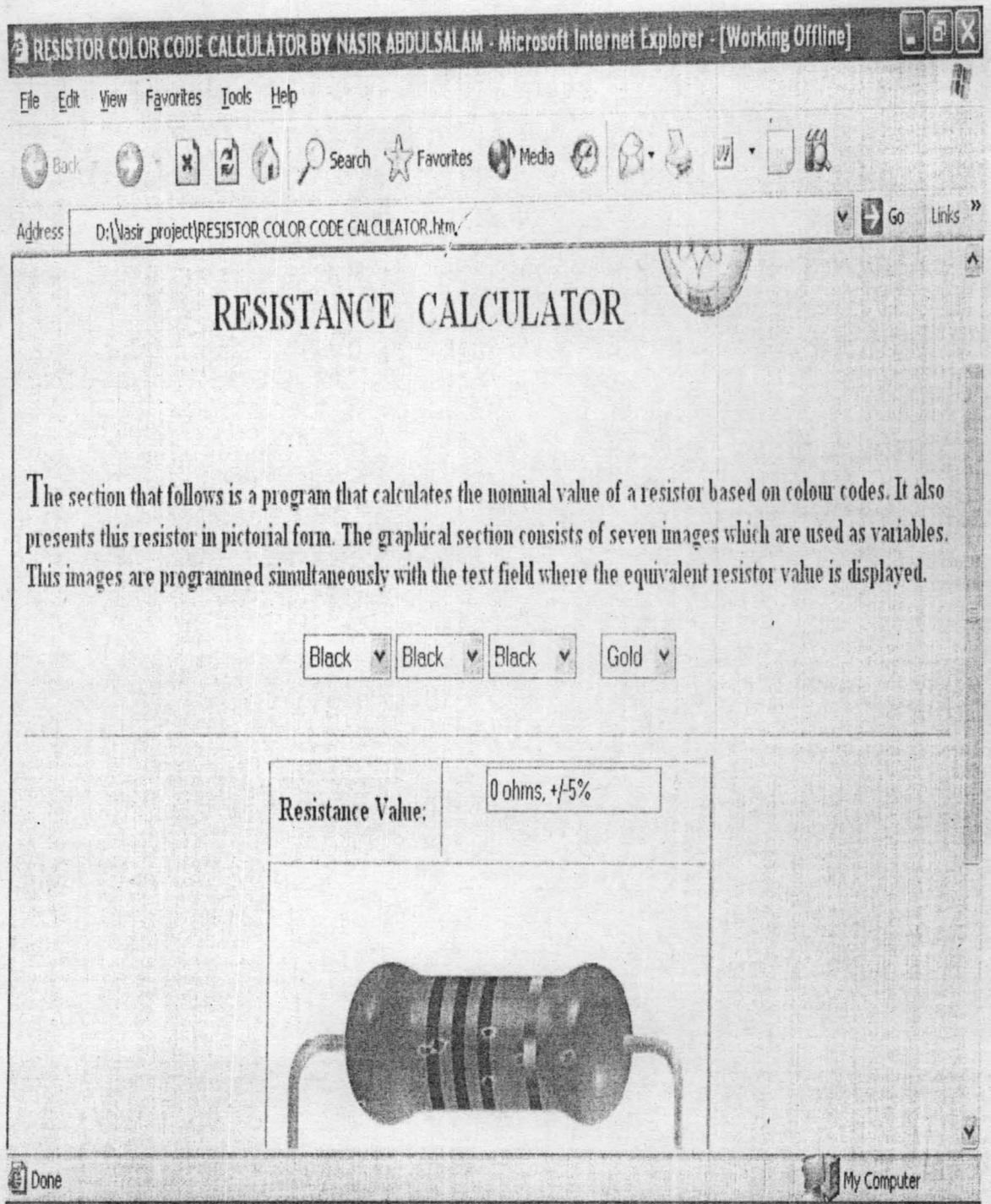
Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White, Gold, Silver, None

FIG 2.2

Each graphic resistor should then consist of seven images including the left handle, first colour (also known as tens colour), second or ones colour, third or multiplier colour, spacer, fourth or tolerance colour and right handle. The first second and third

colour can be any of black, brown, red, orange, yellow, green, blue, violet, gray and white while the fourth colour can be any of gold, silver or none (no colour). Since the colours are dynamic, the naming convention is such that it can be programmed; hence each colour has as its name, a lower case "r" concatenated with the colour name starting with an uppercase character. e.g rGreen, rBlue, rGold. Hence, if COL[x] is the variable used to hold the array of colours and x is the index which could be between 0 and 12 then every colour can be addressed according to rCOL[x]. If the first colour of the array is Black, then sourcing rCOL[0] will return rBlack. The default colours on the page is Black for the first, second and third colour and Gold for the fourth colour.

The source code is given in Appendix A and was written with Wordpad (Notepad could also be used) and saved as a webpage or HTML file with the extension ".htm". The resulting page when initially loaded looks like the figure below;



**FIG 2.3** FOUR COLOUR CODE RESISTOR

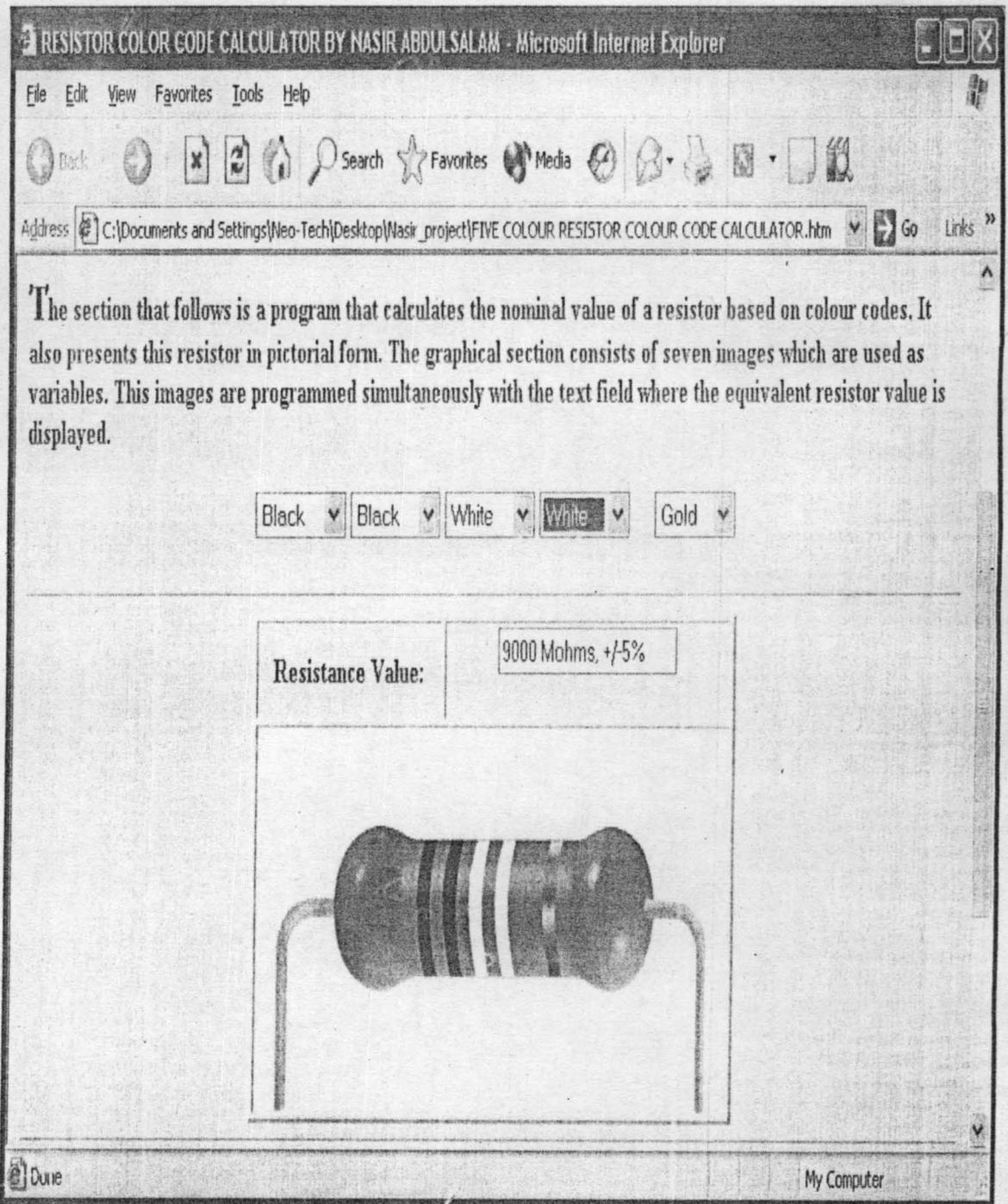


FIG 2.4 FIVE COLOUR CODE RESISTOR

## 2.1 GRADE POINT AVERAGE (GPA) CALCULATOR PAGE

The CGPA Calculator page consists of a form physically created using HTML. The form consists of text fields and a button for triggering the calculation. The text fields allow user inputs which are retrieved by javascript. The user inputs include course grade and equivalent credit worth and optionally, last CGPA as well as total credit taken (TCT). If the last two mentioned inputs are given, then the CGPA is also calculated, otherwise only the SGPA is calculated.

The source code is given in Appendix B and the page looks like the figure below when data is entered and the calculator button is clicked.

CGPA Calculator, by Abdulsalam M Nasir - M... Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Stop Home Search

Address C:\Documents and Settings\Neo-Tech\Desktop\W...

Nasir Abdulsalam your matric number is 2000/10643EE; SGPA = 4.052631578947368 and CGPA = 3.7777777777777777

OK

Enter Your Name	Nasir Abdulsalam		
Matriculation Number	2000/10643EE		
	Grade	Credits	
ECE511	A	2	
ECE512	B	4	
ECE513	A	2	Last Cumulative GP
ECE514	C	2	467
ECE515	C	3	Total Credit Taken

Done My Computer

start Final\_Report... Final\_Report... RESISTOR C... CGPA Calc... Nasir\_project 3:59 PM

FIG 2.5 GRADE POINT AVERAGE (GPA) CALCULATOR

## 2.2 QUADRATIC CALCULATOR PAGE

The quadratic calculator page is capable of solving any quadratic equation by retrieving the values of constants  $a$ ,  $b$ , and  $c$ . The solution includes calculation and display of the roots of the equation in a text field provided, the area bounded by the curve given by the equation, and the horizontal axis. It also displays the gradient (or differential) of the equation as well as the turning point. It also decides whether the turning point is a minimum or maximum point and gives the value of the ordinate at that point. Default values of 8, 10, and 2 are given for  $a$ ,  $b$ , and  $c$  respectively.

The source file is shown as Appendix C and the resulting form looks like the figure below, without data;

Quadratic Calculator And Analyser - Microsoft Internet Explorer - [Working Offline]

File Edit View Favorites Tools Help

Back Search Favorites Media

Address  Go Links



**Quadratic Calculator**

A quadratic is a curve of the parabola family.  
They are written in the format  $ax^2+bx+c=0$ .

$x^2 +$    $x +$    $= 0$

The area bounded by the curve above the x-axis is:  sq. units.

The gradient of the curve at any point is: .

The  value of the curve occurs at co-ordinates: .

[Go to GPA Calculator](#)

[Go to Register Calculator](#)

My Computer

FIG 2.6 QUADRATIC CALCULATOR

## CHAPTER THREE

### 3.0 TESTING AND VALIDATION

At the testing and validation stage, the programs were run on different operating systems and different versions of the same operating system. The scripts were tried on Windows 9X, Windows 2000, Windows XP, Windows Me, Linux Redhat 8.0. On the Linux operating system, the text editor used was *vi*, and the browser used was **Netscape 7.0. Notepad** and **Internet explorer** were used in all Windows environments. The Macintosh environment was however not available for the testing but a Macintosh simulator was used to test the programs. There was however a problem of file path for the Mosaic browser.

### 3.1 PACKAGING AND PUBLISHING

Packaging of the project is done by Writing it to a CD-ROM. Other copies are available on different media for easy retrieval. It can be run while on the removable media or it can be copied to the Hard Disk and run from there. Editing however, cannot be done on a CD-ROM.

The project will be published on several internet servers by uploading onto the servers through the internet or other networks. It will be available as a link on the web page <http://www.geocities.com/nasirabdulsalam> . It will also be published in a directory in the FUT Minna test site <http://www.futminnaconnection.com> .

## CHAPTER FOUR

### 4.0 CONCLUSION AND RECOMMENDATION

Javascript is a very good programming tool since it enables one to have a graphic/pictorial view with minimal programming. Hence one gets to appreciate quickly, the result of the lines of code. It can also work with images as seen in the graphical resistor. The most wonderful thing about Javascript is its simplicity in terms of requirements.

As a recommendation, Javascript can be introduced into students' curricula alongside programming languages like BASIC and PASCAL. Also more functional programs can be written by other students and tied to this work until a vast Library is created. This library (or Resource Centre) will be of invaluable use to upcoming electrical engineering students.

### 4.1 LIMITATIONS

The GPA calculator as designed above, has a database limitation. Since only Notepad and Internet Explorer were used throughout, a report of several users cannot be given since it requires a third party software and a database instance such as Microsoft Access or Oracle and a data retrieval language, e.g. SQL. Also, the quadratic calculator cannot retrieve fractions e.g.  $\frac{1}{8}$  or  $\frac{1}{3}$ . It can however retrieve decimals e.g. 0.125, 0.333.

## REFERENCE

SHELL PETROLEUM INFO TECH GUIDE

DAVID THAU (2003)

DANNY GODMAN

A GUIDE TO HTML

THAU'S  
JAVASCRIPT TUTORIAL,

JAVASCRIPT BIBLE

## APPENDIX A

```
<HTML><HEAD><TITLE>RESISTOR COLOR CODE CALCULATOR BY NASIR  
ABDULSALAM</TITLE>  
<BODY text=#0000ff vLink=#00EF00 aLink=#00FFFF link=#FF0000 bgColor=#FFFF99  
onload=calcOhms()>  
<H1 align="center"><font size="5" face="American Classic">RESISTANCE&nbsp;&nbsp;   
CALCULATOR</font>&nbsp;  </h1>  
<p align="left">  
<SCRIPT language=JavaScript1.1>  
<!-- hide script from nonscriptable browsers
```

```
// create array listing all the multiplier values
```

```
var multiplier = new Array()  
multiplier[0] = 0  
multiplier[1] = 1  
multiplier[2] = 2  
multiplier[3] = 3  
multiplier[4] = 4  
multiplier[5] = 5  
multiplier[6] = 6  
multiplier[7] = 7  
multiplier[8] = 8  
multiplier[9] = 9  
multiplier[10] = -1  
multiplier[11] = -2
```

```
// create array listing all tolerance values
```

```
var tolerance = new Array()  
tolerance[0] = "+/-5%"  
tolerance[1] = "+/-10%"  
tolerance[2] = "+/-20%"
```

```
// format large values into kilo and meg
```

```
function format(ohmage) {  
    if (ohmage >= 10e6) {  
        ohmage /= 10e5  
        return "" + ohmage + " Mohms"  
    } else {  
        if (ohmage >= 10e3) {  
            ohmage /= 10e2  
            return "" + ohmage + " Kohms"  
        } else {  
            return "" + ohmage + " ohms"  
        }  
    }  
}
```

```
// calculate resistance and tolerance values
```

```
function calcOhms() {  
    var form = document.forms[0]  
    var d1 = form.tensSelect.selectedIndex  
    var d2 = form.onesSelect.selectedIndex  
    var m = form.multiplierSelect.selectedIndex  
    var t = form.toleranceSelect.selectedIndex
```







```

<TD><INPUT maxLength=5 align=top size=5 name=CR8></TD></TR>
<TR align=middle>
<TD colspan=3><INPUT onclick=gpacalc() type=button value="Nasir Calculates"
name=CalcButton></TD></TR></TBODY></TABLE></FORM></CENTER>
<p align="left"><b><a href="RESISTOR%20COLOR%20CODE%20CALCULATOR.htm">&nbsp;Go
to Resistor Calculator</a></b></p>
<CENTER>
<P>
<P></CENTER><BR>
<SCRIPT language=JavaScript>
/* This program to calculate the Grade Point Average(CGPA) of a student
was written by My humble self, Abdulsalam M Nasir. */
<!--
function gpacalc()
{
//define valid grades and their values
var gr = new Array(6);
var cr = new Array(6);
var ingr = new Array(8);
var incr = new Array(8);

// define valid grades and their values
var grcount = 6;
gr[0] = "A";
cr[0] = 5;
gr[1] = "B";
cr[1] = 4;
gr[2] = "C";
cr[2] = 3;
gr[3] = "D";
cr[3] = 2;
gr[4] = "E";
cr[4] = 1;
gr[5] = "F";
cr[5] = 0;

// this section will retrieve what the user inputs
ingr[0] = document.GPACalcForm.GR1.value;
ingr[1] = document.GPACalcForm.GR2.value;
ingr[2] = document.GPACalcForm.GR3.value;
ingr[3] = document.GPACalcForm.GR4.value;
ingr[4] = document.GPACalcForm.GR5.value;
ingr[5] = document.GPACalcForm.GR6.value;
ingr[6] = document.GPACalcForm.GR7.value;
ingr[7] = document.GPACalcForm.GR8.value;
incr[0] = document.GPACalcForm.CR1.value;
incr[1] = document.GPACalcForm.CR2.value;
incr[2] = document.GPACalcForm.CR3.value;
incr[3] = document.GPACalcForm.CR4.value;
incr[4] = document.GPACalcForm.CR5.value;
incr[5] = document.GPACalcForm.CR6.value;
incr[6] = document.GPACalcForm.CR7.value;
incr[7] = document.GPACalcForm.CR8.value;

// This section will Calculate GPA
var sgp =0;

```

```

var sct = 0;
var gpa = 0;
for (var x = 0; x < 8; x++)
{
    if (ingr[x] == "") break;
    if (isNaN(parseInt(incr[x]))) alert("Error- You did not enter a numeric credits value for the course If
the course is worth 0 credits then enter the number 0 in the field.");
    var validgrcheck = 0;
    for (var xx = 0; xx < grcount; xx++)
    {
        if (ingr[x] == gr[xx])
        {
            sgp = sgp + (parseInt(incr[x],10) * cr[xx]);
            sct = sct + parseInt(incr[x],10);
            validgrcheck = 1;
            break;
        }
    }
    if (validgrcheck == 0)
    {
        alert("Error- Could not recognize the grade entered for ECE 51" + eval(x + 1) + ". Please use
standard FUT Minna grades in the form of A B C D E or F. Use uppercase Characters");
        return 0;
    }
}

// this if-check prevents a divide by zero error
if (sct == 0)
{
    alert("Error- You did not enter any credit values! GPA = N/A");
    return 0;
}

//this gets the last CGPA and the Total Credit Taken
var CGPA = document.GPACalcForm.LGP.value;
var tct = document.GPACalcForm.tct.value;
gpa = sgp / sct;

alert("SGPA = " + eval(gpa) + " and CGPA = " + eval((((CGPA * (tct - sct))) + sgp) / (tct)));

return 0;
}
//-->
</SCRIPT>
<b><a href="Quadratic.htm">Go to Quadratic Calculator</a></b></P></BODY></HTML>

```

## APPENDIX C

```
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
<title>Quadratic Calculator And Analyser</title>
</head>
<body bgcolor="#FFFF99"><H1 align="center"><font size="5" face="American Classic"></font>&nbsp;
</h1>
<p align="left">
<font color="#663300"><b>
<SCRIPT language="JavaScript">
<!--
function quadData1() {
var valA = document.quadCalc.valA.value;
var valB = document.quadCalc.valB.value;
var valC = document.quadCalc.valC.value;
var disc = (valB*valB)-(4*valA*valC);
var r_disc = Math.sqrt(disc);
var vax1 = (-valB+r_disc)/(2*valA);
var vax2 = (-valB-r_disc)/(2*valA);
var ing1 = ((valA*vax1*vax1*vax1)/3)+((valB*vax1*vax1)/2)+(valC*vax1);
var ing2 = ((valA*vax2*vax2*vax2)/3)+((valB*vax2*vax2)/2)+(valC*vax2);
var inte = ing1-ing2;
var sec_dx = (-valB)/(2*valA);
var sec_dy = (valA*sec_dx*sec_dx)+(valB*sec_dx)+(1*valC);
var e_val;
vax1 = Math.round(vax1*100)/100;
vax2 = Math.round(vax2*100)/100;
inte = Math.round(inte*100)/100;
sec_dx = Math.round(sec_dx*100)/100;
sec_dy = Math.round(sec_dy*100)/100;
if (valA == 0) {document.quadCalc.answer1.value = "This curve is not a quadratic. Enter a non-zero value
in the first box.";}
else {
if (disc>0) {
document.quadCalc.answer1.value = "The curve intercepts the x-axis at: " +vax1+ " and " +vax2+ ".";
{
if (inte>0) {document.quadCalc.answer2.value = inte;}
if (inte<0) {document.quadCalc.answer2.value = -inte;}
if (inte=0) {document.quadCalc.answer2.value = 0;}
}
} if (disc<0) {
document.quadCalc.answer1.value = "The curve has no real roots, because it does not intercept the real x-
axis.";
document.quadCalc.answer2.value = "N/A";
} if (disc=0) {
document.quadCalc.answer1.value = "The curve touches the x-axis at: " +vax1+ ".";
document.quadCalc.answer2.value = "N/A";
}
document.quadCalc.answer3.value = (2*valA)+ "x"+ valB;
if (valA<0) {e_val = "maximum";}
if (valA>0) {e_val = "minimum";}
document.quadCalc.answer4.value = e_val;
document.quadCalc.answer5.value = sec_dx+ " , " +sec_dy;
```

```

}
}
//-->
</SCRIPT>
Quadratic Calculator </b></font>
<form name="quadCalc">
<b>
<font color="#663300" face="Rockwell" size="-1">
A quadratic is a curve of the parabola family.<br>
They are written in the format  $ax^2+bx+c=0$ .<br><br>
</font>
</b>
<font color="000000" face="Rockwell" size="-1">
<input maxlength="8" name="valA" value="8" size="4" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> $x^2$ +
</font>
</b>
<font color="000000" face="Rockwell" size="-1">
<font color="#663300">
<input maxlength="8" name="valB" value="10" size="4" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> $x+$ 
</font>
</b><font color="#663300">
<input maxlength="8" name="valC" value="2" size="4" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> $=0$ <br>
</font>
</b><font color="#663300">
<input type="button" onClick=quadData1() value="Calculate" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> </font>
</b><font color="#663300">
<input type="reset" value="Reset" style="font-weight: 700"></font><b><font color="#663300"
face="Rockwell" size="-1"><br>
</font>
</b><font color="#663300">
<input name="answer1" readonly="readonly" size="60" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"><br>
The area bounded by the curve above the x-axis is: </font>
</b><font color="#663300">
<input name="answer2" readonly="readonly" size="6" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> sq. units.<br>
The gradient of the curve at any point is: </font>
</b><font color="#663300">
<input name="answer3" size="10" style="font-weight: 700"></font><b><font color="#663300"
face="Rockwell" size="-1">.<br>
The </font>
</b><font color="#663300">
<input name="answer4" readonly="readonly" size="8" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1"> value of the curve occurs at co-ordinates: </font>
</b><font color="#663300">
<input name="answer5" readonly="readonly" size="10" style="font-weight: 700"></font><b><font
color="#663300" face="Rockwell" size="-1">.</font></b></font><b><font color="#663300">
</font></b>
</form>
<p><b><a href="CGPA%20Calculator.htm">Go to GPA Calculator</a></b></p><p><b><a
href="RESISTOR%20COLOR%20CODE%20CALCULATOR.htm">Go to Resistor
Calculator</a></b></p></body></html>

```