A Training Report on

Programming Foundation with JavaScript, HTML and CSS

Organized by

Duke University (Coursera)

Submitted in partial fulfillment of award of

BACHELOR OF TECHNOLOGY

degree

in

Computer Science and Engineering

By

Yash Bhatnagar
(2000820100156)

Under the Guidance of
Dr. Manish Gupta
(Associate Professor)

Department of Computer Science and Engineering
Moradabad Institute of Technology, Moradabad (U.P.)

Session: 2021-22

MORADABAD INSTITUTE OF TECHNOLOGY

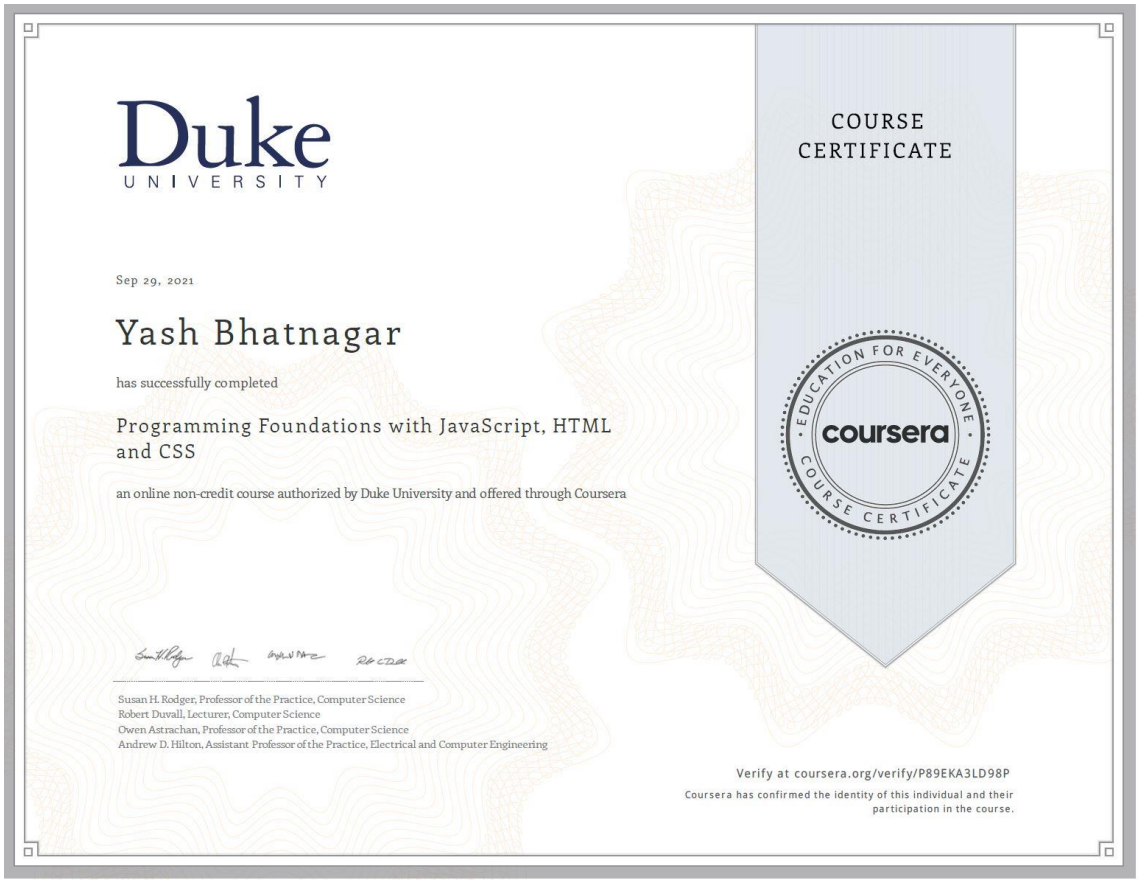
Department of Computer Science & Engineering

CERTIFICATE

Certified that the Industrial Training entitled **Programming Foundation with JavaScript, HTML and CSS** submitted by **Yash Bhatnagar** Roll Number – **2000820100156** in their own work and has been carried under my supervision. It is recommended that the candidates may now be evaluated their industrial training work by the university.

Date:

Dr. Manish Gupta
(Associate Professor)


Duke
UNIVERSITY
COURSE
CERTIFICATE
Sep 29, 2021
Yash Bhatnagar
has successfully completed
Programming Foundations with JavaScript, HTML and CSS
an online non-credit course authorized by Duke University and offered through Coursera
EDUCATION FOR EVERYONE
coursera
COURSE CERTIFICATE
Susan H. Rodger, Professor of the Practice, Computer Science
Robert Duvall, Lecturer, Computer Science
Owen Astrachan, Professor of the Practice, Computer Science
Andrew D. Hilton, Assistant Professor of the Practice, Electrical and Computer Engineering
Verify at coursera.org/verify/P89EKA3LD98P
Coursera has confirmed the identity of this individual and their participation in the course.

GRADES

Grades

You have completed all of the assignments that are currently due.

You passed this course! Your grade is 91.42%.

Item	Status	Due	Weight	Grade
Designing a Web Page with HTML and CSS Quiz	Passed	Oct 11 12:29 PM IST	25%	90%
Overview of Programming Concepts Quiz	Passed	Oct 18 12:29 PM IST	25%	90%
Interactive Web Pages Quiz	Passed	Oct 25 12:29 PM IST	25%	85.71%
Review of HTML, CSS, and JavaScript Quiz	Passed	Nov 1 12:29 PM IST	25%	100%

Honors Assignments

Optional - complete these to earn honors distinction for this course

ABSTRACT

This course, Programming Foundations with JavaScript, HTML and CSS by Duke University, introduces the basics of HTML, CSS and JavaScript – these are the front-end web technologies used to create webpages. So this course will help out participants to create their own webpages. Through this course, the participants learn HTML, CSS and JavaScript basic syntax and logics and greatly benefit from performing hands-on-exercises. Apart from this this, it is beneficial to write the lines of code by following the instructor and/or the provided hangouts. The instructor and his assistants will help the individuals with their questions and problems. The instructor will use a mac machine to cover the topics the participants are expected to bring their own computer systems irrespective of their operating systems. The instructor and his assistants will be available to help the participants with their setup of the needed website for the workshop prior to the start of the workshop. The topics include HTML syntax, elements, tags, linking pages, creating lists, CSS syntax, classes & IDs, standard color selection, JavaScript syntax, conditional statements, loops etc.

ACKNOWLEDGEMENT

Apart my efforts, the success of any project depends largely on the encouragement and guidelines of many others. I take this opportunity to express my gratitude to the people who have been instrumental in the successful completion of this project. I express deep sense of gratitude to almighty God for giving me the strength for the successful completion of the project. I express my heartfelt gratitude to my parents for constant encouragement while carrying out this project. I gratefully acknowledge the contribution of the individuals who contributed in bringing this project up to this level, who continues to look after me despite my flaws, I express my deep sense of gratitude to Dr. Rohit Garg, the luminary the Director, Moradabad Institute of Technology who has been continuously motivating and extending their helping hand to us. I express my sincere thanks to

Dr. Somesh Kumar, the HOD of the Moradabad Institute of Technology, for constant encouragement and the guidance provided during this project. My Sincere thanks to Dr. Manish Gupta, Associate Professor & the Counsellor who guided me to prepare this report. At last, my sincere thanks to Ms. Richa Saxena and Ms. Prachi Gupta, Master In- charge, a guide, and a mentor who critically reviewed my project and helped in solving each and every problem, occurred during implementation of the project. The guidance and support received from all the members who contributed and who are contributing to this project, was vital for the success of the project. I am grateful for their constant support and help.

Yash Bhatnagar
(2000820100156)

TABLE OF CONTENTS

CHAPTER – 1

INTRODUCTION – HTML

2.1 HTML

The Hypertext Markup Language, or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.

Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a webpage semantically and originally included cues for the appearance of the document.

Html elements are the building blocks of HTML pages. With HTML constructs, image, and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items.

2.2 BASIC SYNTAX

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>Heading</h1>
<p>paragraph</p>

</body>
</html>
```

2.3 TYPES OF ELEMENTS

The elements in HTML are use for different purposes and they are classified into two categories – Metadata and Selection.

2.3.1 Metadata elements

<html> </html>
<head> </head>
<title> </title>

2.3.2 Selection elements

<body> </body>
<h1> </h1>

2.4 TAGS

Tags in HTML are use to style of the text like paragraph, bold, italic, insert images, liking text and images to other links etc.

2.4.1 Important tags

Some of the important tags are given below:

  use to bold the text

  use to emphasize or italic the text

2.4.2 IMG tag

<img src="img_tag.jpg" alt="this is img tag" width="500" height="600">

It is use to insert the image on the webpage.

2.5 LINKING PAGES

Visit Google India!

Here a stand for anchor and anchor tag is used to link hyperlinks with text and images present on the webpage.

2.6 LIST IN HTML

Unordered List

```
<ul>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>
```

OUTPUT

- Coffee
- Tea
- Milk

Ordered List

```
<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>
```

OUTPUT

1. Coffee
2. Tea
3. Milk

CHAPTER – 2

INTRODUCTION – CSS & OTHER IMPORTANT TOPICS

3.1 – CSS

- CSS stands for Cascading Style Sheets
- CSS describes how HTML elements are to be displayed on screen, paper, or in other media
- CSS saves a lot of work. It can control the layout of multiple web pages all at once
- External stylesheets are stored in CSS files

3.2 – CLASSES & IDs

Classes

```
.center {
  text-align: center;
  color: red;
}
```

IDs

```
#para1 {
  text-align: center;
  color: red;
}
```

3.3 – STANDARD COLORS

There are total 140 Standard colors but we can also assign the customized color by using the RGB values that color.

```
<h1 style="background-color:DodgerBlue;">Hello World</h1>
<p style="background-color:Tomato;">Tomato...</p>
```

CHAPTER – 3

INTRODUCTION - JAVASCRIPT

1.1 INTRODUCTION

- JavaScript is the world's most popular programming language.
- JavaScript is the programming language of the Web.
- JavaScript is easy to learn.
- This tutorial will teach you JavaScript from basic to advanced.

1.2 CALLING METHODS

The dot (.) operator is used to call the functions.

Examples,

```
var fgImage = new SimpleImage (“drewGreen.png”);
var w = fgImage.getWidth( );
var h = fgImage.getHeigth( );
```

1.3 LOOPS

```
for (let i = 0; i < cars.length; i++) {
  text += cars[i] + "<br>";
}
```

4.4 FUNCTIONS

```
fuction square (x)
{
        var ans = x*x;
        return ans;
}
var y = square(4)
```

1.4 CONDITIONAL STATEMENTS

They are used to provide output as per the condition required.

Example,

```
if (time < 10) {
  greeting = "Good morning";
} else if (time < 20) {
  greeting = "Good day";
} else {
  greeting = "Good evening";
}
```

1.5 CREATING BUTTON AND USING IT

Button tag in HTML is used to insert the button on the webpage and what this button does can be defined using JavaScript.

```
<button type="button">Click Me! </button>
```

CHAPTER – 4

PROJECT DESCRIPTION

5.1 OVERVIEW

I made webpage by using front-end web technologies – HTML, CSS and JavaScript

- The webpage title is "**Image Filters**", suggests the project is all about the website with which user can apply different fun filters on the images upload by the user(client).
- Thanks to Duke University as they have provided the JavaScript file that contains the code which is used as a kind of library file in the project.
- User the download the filtered image if he/she like that.
- The downloaded output image possesses its original resolution and hench there is no loss of quality in the input and the output image.

5.2 STEPS TO FOLLOW

- Firstly, open the webpage.
- The webpage shows a 'Choose Files' button.
- Click on the button and choose the required image you want to customize with filters.
- Now you'll see the chosen image on the on the webpage and now you can select whatever filter you want to apply on that image.
- You can also download the filtered image by right clicking the image and then choose the 'Save image as..' option.
- The download image retains its original resolution as the uploaded (chosen) image. Hence provide the same quality of the image.

5.3 PROJECT CODE AND OUTPUT

5.3.1 HTML Source Code

```
<!DOCTYPE html>
<html lang="en" >
<head>
  <meta charset="UTF-8">
  <title>Image Filtering</title>
  <link rel="stylesheet" href="./style.css">
</head>
<body>
<!-- partial:index.partial.html -->

<script
src="https://www.dukelearntoprogram.com/course1/common/js/image/SimpleImage.
js" ></script>
<script src="./DukeUniversitySimpleImage.js" ></script>

<h1>Image Filters</h1>
<p> <canvas id="can"> </canvas></p>

<h2>Load Image</h2>
<input type="file" multiple="false" accept="image/*" id="file"
onchange="upload()" >

<h2>Filters</h2>

<p> <input type="button" value="Red-ish" onclick="doReddish()"> <input
type="button" value="Greenish" onclick="doGreenish()"> <input type="button"
value="Blue-ish" onclick="doBlueish()"></p>

<p> <input type="button" value="GrayScale" onclick="doGray()"> <input
type="button" value="Rainbow" onclick="doRainbow()"> </p>

<p> <input type="button" value="Original" onclick="makeOriginal()"> </p>

<!-- partial -->
<script  src="./script.js"></script>

</body>
</html>
```

Fig.4.1 – HTML code

5.3.2 CSS Source Code

```css
body {
    background: linear-gradient(45deg, #ee7752, #e73c7e, #23a6d5, #23d5ab);
    background-size: 400% 400%;
    animation: gradient 7s ease infinite;
}

@keyframes gradient {
    0% {
        background-position: 0% 50%;
    }
    50% {
        background-position: 100% 50%;
    }
    100% {
        background-position: 0% 50%;
    }
}

canvas {
  border: 1px solid;
  height: 400px;
}
```

Fig.4.2 – CSS code

5.3.3 Logic used in JavaScript

Color	avg < 128	avg >= 128
Red	R 2*avg G 0 B 0	R 255 G 2*avg - 255 B 2*avg - 255
Orange	R 2*avg G 0.8*avg B 0	R 255 G 1.2*avg - 51 B 2*avg - 255
Yellow	R 2*avg G 2*avg B 0	R 255 G 255 B 2*avg - 255
Green	R 0 G 2*avg B 0	R 2*avg - 255 G 255 B 2*avg - 255
Blue	R 0 G 0 B 2*avg	R 2*avg - 255 G 2*avg - 255 B 255
Indigo	R 0.8*avg G 0 B 2*avg	R 1.2*avg - 51 G 2*avg - 255 B 255
Violet	R 1.6*avg G 0 B 1.6*avg	R 0.4*avg + 153 G 2*avg - 255 B 0.4*avg + 153

Fig.4.3 – Programming Logic

5.3.4 JavaScript Source Code

```
var originalImage = null;
var grayImage = null;
var reddisImage = null;
var greenishImage = null;
var blueishImage = null;
var rainbowImage = null;
var imgcanvas = document.getElementById("can");

function upload() {
   var fileinput = document.getElementById("file");
   originalImage = new SimpleImage(fileinput);
   grayImage = new SimpleImage(fileinput);
   reddishImage = new SimpleImage(fileinput);
   greenishImage = new SimpleImage(fileinput);
   blueishImage = new SimpleImage(fileinput);
   rainbowImage = new SimpleImage(fileinput);
   originalImage.drawTo(imgcanvas);
}

function imageIsLoaded(image) {
  return (!image == null  || image.complete());
}

//to make image greenish
function makeGreenish(image) {
  for (var pixel of image.values()) {
    var avg = (pixel.getRed()+pixel.getGreen()+pixel.getBlue())/3;
    if (avg < 128) {
    pixel.setRed(0);
    pixel.setGreen(2*avg);
    pixel.setBlue(0);
    }
    else {
    pixel.setRed(2*avg - 255);
    pixel.setGreen(255);
    pixel.setBlue(2*avg - 255);
    }
  }
  return image;
}

//to make image reddish
function makeReddish(image) {
  for (var pixel of image.values()) {
    var avg = (pixel.getRed()+pixel.getGreen()+pixel.getBlue())/3;
```

```
    if (avg < 128) {
    pixel.setRed(2*avg);
    pixel.setGreen(0);
    pixel.setBlue(0);
    }
    else {
    pixel.setRed(255);
    pixel.setGreen(2*avg - 255);
    pixel.setBlue(2*avg - 255);
    }
  }
  return image;
}

//to make image blueish
function makeBlueish(image) {
  for (var pixel of image.values()) {
    var avg = (pixel.getRed()+pixel.getGreen()+pixel.getBlue())/3;
    if (avg < 128) {
    pixel.setRed(0);
    pixel.setGreen(0);
    pixel.setBlue(2*avg);
    }
    else {
    pixel.setRed(2*avg - 255);
    pixel.setGreen(2*avg - 255);
    pixel.setBlue(255);
    }
  }
  return image;
}

//to make image grayscale
function makeGray(image) {
  for (var pixel of image.values()) {
  var avg = (pixel.getRed()+pixel.getGreen()+pixel.getBlue())/3;
  pixel.setRed(avg);
  pixel.setGreen(avg);
  pixel.setBlue(avg);
 }
 return image;
}

//to make rainbow
function makeRainbow(image) {
  var h = image.getHeight();
```

```
for (var pixel of image.values()) {
  var y = pixel.getY();
  var avg = (pixel.getRed()+pixel.getGreen()+pixel.getBlue())/3;
  //VIBGYOR in reverse order

  //R - Red
  if (y < h/7) {
     if (avg < 128) {
      pixel.setRed(2*avg);
      pixel.setGreen(0);
      pixel.setBlue(0);
     }
     else {
      pixel.setRed(255);
      pixel.setGreen(2*avg - 255);
      pixel.setBlue(2*avg - 255);
     }
  }

  //O - Orange
  else if (y < 2*h/7) {
     if (avg < 128) {
      pixel.setRed(2*avg);
      pixel.setGreen(0.8*avg);
      pixel.setBlue(0);
     }
     else {
      pixel.setRed(255);
      pixel.setGreen(1.2*avg - 51);
      pixel.setBlue(2*avg - 255);
     }
  }

  //Y - Yellow
  else if (y < 3*h/7) {
     if (avg < 128) {
      pixel.setRed(2*avg);
      pixel.setGreen(2*avg);
      pixel.setBlue(0);
     }
     else {
      pixel.setRed(255);
      pixel.setGreen(255);
      pixel.setBlue(2*avg - 255);
     }
  }
```

```
    //G - Green
    else if (y < 4*h/7) {
       if (avg < 128) {
        pixel.setRed(0);
        pixel.setGreen(2*avg);
        pixel.setBlue(0);
       }
       else {
        pixel.setRed(2*avg - 255);
        pixel.setGreen(255);
        pixel.setBlue(2*avg - 255);
       }
    }

    //B - Blue
    else if (y < 5*h/7) {
       if (avg < 128) {
        pixel.setRed(0);
        pixel.setGreen(0);
        pixel.setBlue(2*avg);
       }
       else {
        pixel.setRed(2*avg - 255);
        pixel.setGreen(2*avg - 255);
        pixel.setBlue(255);
       }
    }

    //I - Indigo
    else if (y < 6*h/7) {
       if (avg < 128) {
        pixel.setRed(0.8*avg);
        pixel.setGreen(0);
        pixel.setBlue(2*avg);
       }
       else {
        pixel.setRed(1.2*avg - 51);
        pixel.setGreen(2*avg - 255);
        pixel.setBlue(255);
       }
    }

    //V - Violet
    else {
       if (avg < 128) {
        pixel.setRed(1.6*avg);
        pixel.setGreen(0);
```

```
        pixel.setBlue(1.6*avg);
       }
       else {
        pixel.setRed(0.4*avg + 153);
        pixel.setGreen(2*avg - 255);
        pixel.setBlue(0.4*avg + 153);
       }
    }
  }
  return image;
}

//to change the image to original image
function makeOriginal() {
  originalImage.drawTo(imgcanvas);
}

function doReddish() {
  if (imageIsLoaded(reddishImage)) {
    makeReddish(reddishImage);
    reddishImage.drawTo(imgcanvas);
  }
}
function doGreenish() {
  if (imageIsLoaded(greenishImage)) {
    makeGreenish(greenishImage);
    greenishImage.drawTo(imgcanvas);
  }
}
function doBlueish() {
  if (imageIsLoaded(blueishImage)) {
    makeBlueish(blueishImage);
    blueishImage.drawTo(imgcanvas);
  }
}
function doGray() {
  if (imageIsLoaded(grayImage)) {
    makeGray(grayImage);
    grayImage.drawTo(imgcanvas);
  }
}
function doRainbow() {
  if (imageIsLoaded(rainbowImage)) {
    makeRainbow(rainbowImage);
    rainbowImage.drawTo(imgcanvas);
  }
}
```

Fig.4.4 – JavaScript Complete Code

5.3.5 Output Webpage

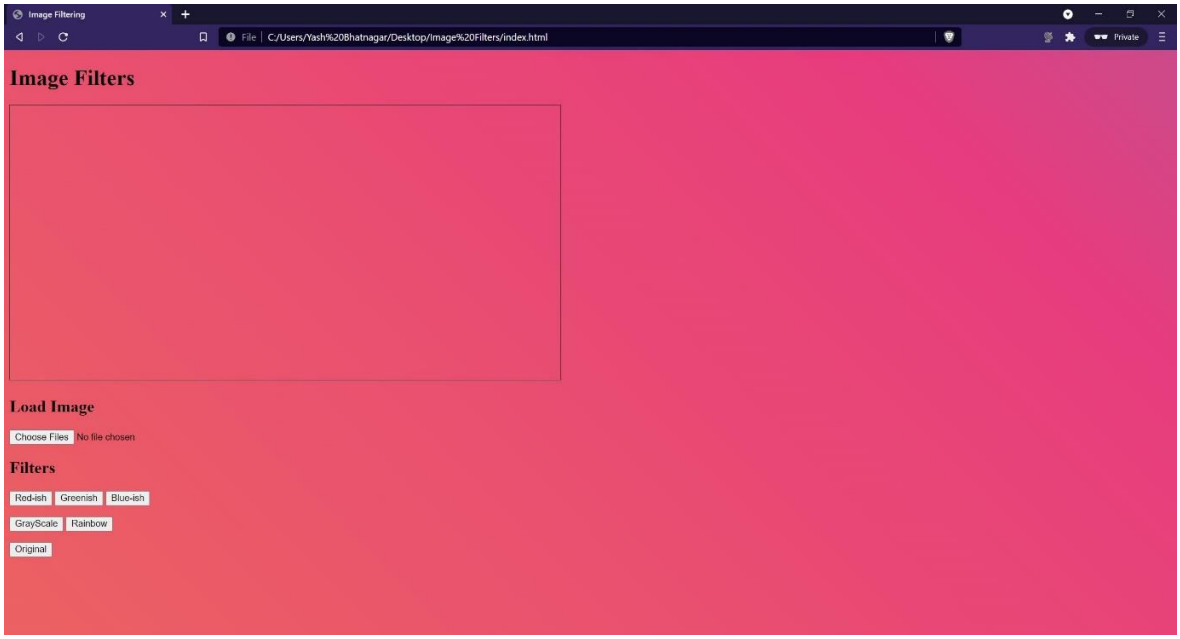


Fig.4.5(a) – Webpage (1)

1. Clicked on the ‘Choose Files’ Button & upload the image named ‘Scene-4k.jpg’.

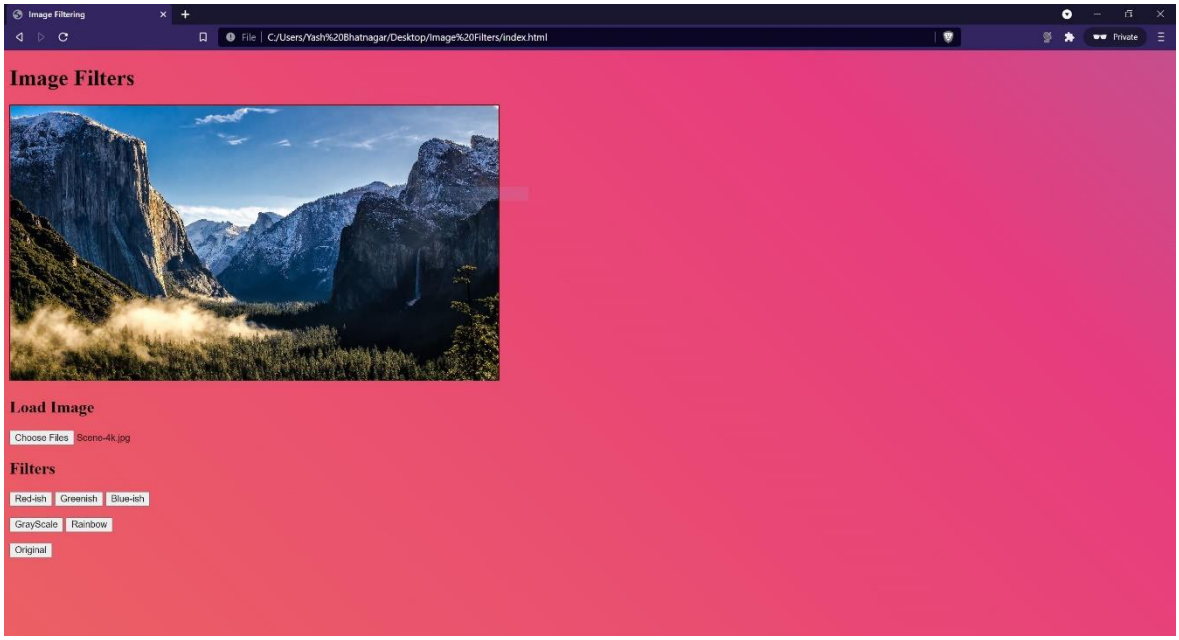


Fig.4.5(b) – Webpage (2)

2. Clicked on the ‘Rainbow’ Button & the rainbow filter is applied on the uploaded image.

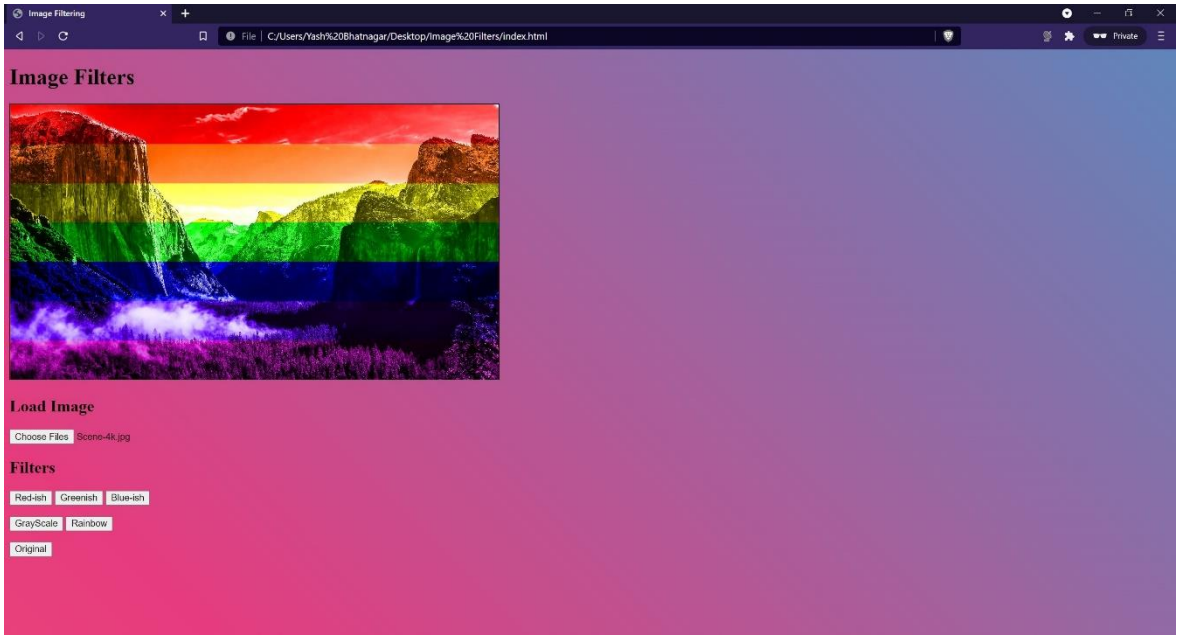


Fig.4.5(c) – Webpage (3)

3. Save the filtered image by right clicking the image and then choose the ‘Save image as..’ option.

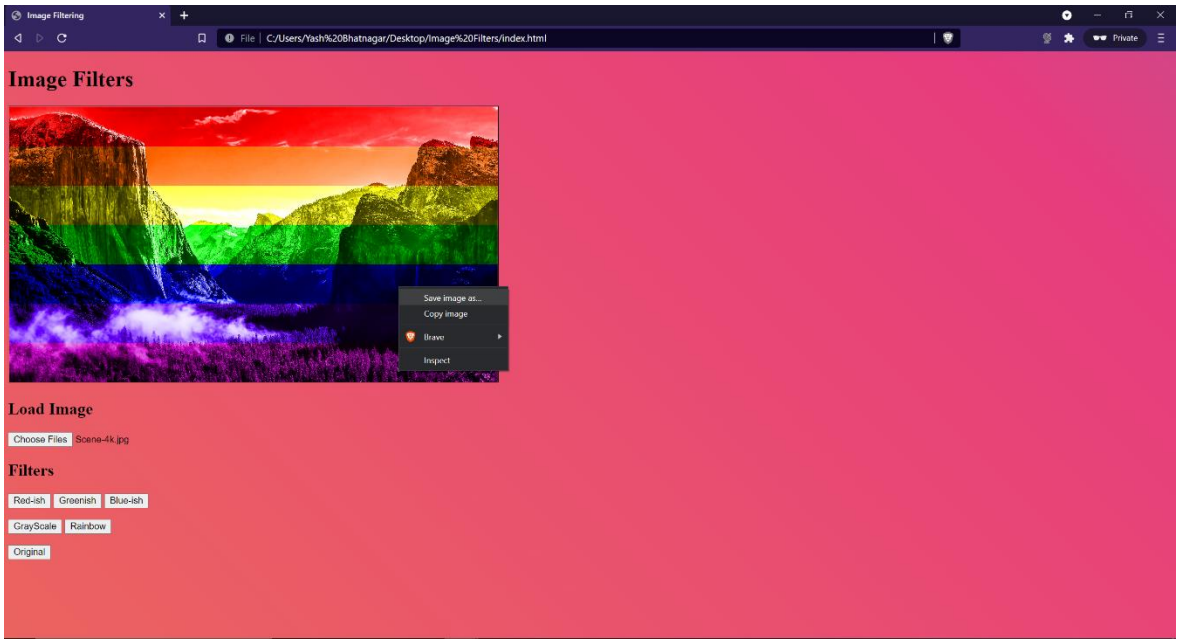


Fig.4.5(d) – Webpage (4)

4. The output image is now saved in the user’s system.

5.4 Project Conclusion

After following the above steps, we can conclude that:

- The webpage can be used to apply the different filters on the image which the user can download (if needed).
- The downloaded image is of the same resolution as the uploaded (original) image. Hence there is no loss of quality in the output images during the whole process.
- The user now no more required to download any third-party software which might breach the user privacy & could the access to the user's personal images.

CHAPTER – 5

CONCLUSION

This course, Programming Foundations with JavaScript, HTML and CSS, introduces the basics of HTML, CSS and JavaScript using the website codepen.io which is very popular for making front-end projects for the beginners and very easy to use as it provides the real time execution of HTML, CSS and JavaScript codes all together and that proves to be very useful while creating a webpage like this. The course has no prerequisites. It will cover Chapters 1-4 mention in the above part of the report. The course is for you if you're a newcomer to web development, if you need a refresher on front-end web technologies i.e., HMTL, CSS and JavaScript, or if you may have had some exposure to these technologies but want a more in-depth exposition and vocabulary in your logics. This is the first of five courses in the Java Programming and Software Engineering Fundamentals Specialization.

BIBLIOGRAPHY

- https://www.coursera.org/in
- https://www.w3schools.com/
- https://www.dukelearntoprogram.com/course1/doc
- https://developer.mozilla.org/en-US/docs
- https://codepen.io/