**MUSIC PLAYER**

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**A PROJECT REPORT**

###### ***Submitted by***

Group 192

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*in partial fulfillment for the award of the degree*

*of*

****

**BACHELOR OF TECHNOLOGY**

**SCHOOL OF COMPUTING SCIENCE AND ENGINEERING**

**VIT BHOPAL UNIVERSITY**

**KOTHRIKALAN, SEHORE**

**MADHYA PRADESH - 466114**

DEC 2021

(A typical specimen of Bonafide Certificate)

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**BONAFIDE CERTIFICATE**

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Certified that this project report titled **“Algorithm Visualizer”** is the team work of

**“**Shivam Dubey ( 20BCE10133) **Peer Hammad Hameed Thoker (20BCE10143), Shubhankan Sharma (20BCE10857), Deepak Kumar ( 20BCE101660), Yashraj (20BCE10575)”** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported at this time does not form part of any other project/research work based on which a degree or award was conferred on an earlier occasion on this or any other candidate.

**PROGRAM CHAIR PROJECT GUIDE**

<<Name>>,<<Designation>> <<Name>>,<< Designation>>

School of Computer Science and Engineering School of Computer Science and Engineering

VIT BHOPAL UNIVERSITY VIT BHOPAL UNIVERSITY

The Project Exhibition I Examination is held on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**ACKNOWLEDGEMENT**

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First and foremost I would like to thank the Lord Almighty for His presence and immense blessings throughout the project work.

I wish to express my heartfelt gratitude to **Dr Sandip Mal** , Head of the Department, School of Aeronautical Science for much of his valuable support encouragement in carrying out this work.

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**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **Abbreviation** | **Meaning** |
| **VS code** | **Visual studio code** |
| **HTML** | **Hyper Text Markup Language** |
| **CSS** | **Cascading Style Sheets** |
| **JS** | **Javascript** |

**List of figures and graphs**

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**ABSTRACT**

**PURPOSE -METHODOLOGY**

• Our project was focusing on the power of Algorithm Visualizers, how it can be beneficial to those who wish to study algorithms by visualizing them graphically

• It mainly aims to simplify and deepen the understanding of algorithms operation.

• Within the project we discuss the possibility of enriching the standard methods of teaching algorithms, with the algorithm visualizations

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CHAPTER-1

PROJECT DESCRIPTION AND OUTLINE

Introduction

Selection sort is the simplest sorting algorithm that works by repeatedly finding the minimum element (considering ascending order) from the unsorted part and putting it at the beginning. An algorithm like Selection Sort can be easily understood by visualizing instead of long codes. In our project we will be using the combinative knowledge of HTML, CSS & JavaScript to produce a simple web based simulation of the selection sort algorithm.

**Chapter 2**

**Related WORK INVESTIGATION**

**CHAPTER-3:**

A modern web browser is required for the project.

Some software required are:

* Visual studio code
* HTML
* CSS
* JavaScript

***Visual Studio Code***

"Visual" Basic was "Visual" because of the forms development GUI. "Visual" C++ was "Visual" because of MFC and the wizards for creating an MFC application.

The original language is Visual Basic.

Developers are highly opinionated when it comes to code editors. Some people swear by Vim. Others are Sublime and Atom advocates. However,

there is one particular contender that’s so prevalently mainstream that you

can’t ignore it. This little big code editor is known as Visual Studio Code.

***HTML***

Hypertext Markup Language (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.

HTML elements are the building blocks of HTML pages. With HTML constructs, images 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. HTML elements are delineated by tags, written using angle brackets.

***CSS***

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file which reduces complexity and repetition in the structural content as well as enabling the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

***JAVASCRIPT***

JavaScript often abbreviated as JS, is a programming language that conforms tothe ECMAScript specification. JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web.

JavaScript enables interactive web pages and is an essential part of web applications. The vast

majority of websites use it for client-side page behavior, and all major web browsers have a

dedicated JavaScript engine to execute it.

As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).

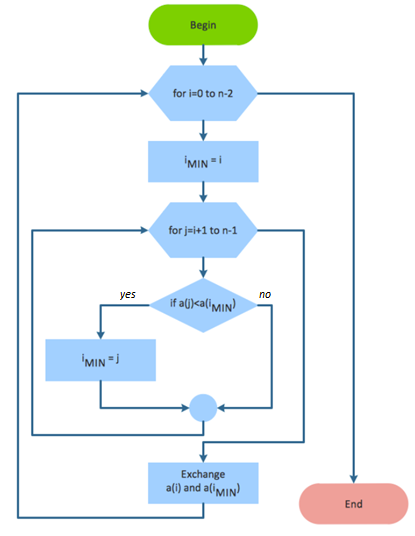
*Chapter 4: Design methodology and novelty*

Our project is an interactive platform that visualizes algorithm from code. The project will also focus on dynamic graphics to visualize computation of a given algorithm.

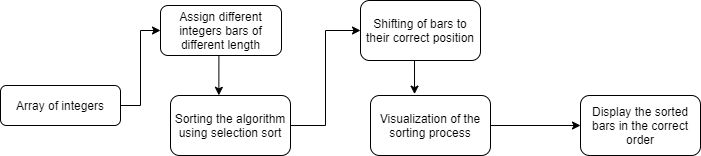
The project will also exhibit new forms of design and complexities. A sorted technique is going to be followed

**Chapter 5 Technical implementation and analysis**

***Flow chart of music playing program***



***Overall system Architecture diagram***



Implementation and Coding

HTML:

<!DOCTYPE html>

<html lang="en">

<!-- head -->

<head>

<meta charset="UTF-8" />

<meta name="viewport"

content="width=device-width, initial-scale=1.0" />

<meta http-equiv="X-UA-Compatible" content="ie=edge" />

<!-- title -->

<title>Sorting Visualizer</title>

<!-- linking style.css -->

<link href="style.css" rel="stylesheet" />

</head>

<!-- body -->

<body >

<section class="head">Selection Sort Visualizer</section>

<section class="data-container"></section>

<!-- "Generate New Array" button -->

<button class="btn1" onclick="generate()" id="Button1" >

Generate New Array</button>

<!-- "Selection Sort" button -->

<button class="btn2"

onclick="SelectionSort(),disable()" id="Button2" >

Selection Sort</button>

</body>

<!-- linking index.js -->

<script src="index.js"></script>

</html>

JavaScript:

const container = document.querySelector(".data-container");

// function to generate bars

function generatebars(num = 20) {

//for loop to generate 20 bars

for (let i = 0; i < num; i += 1) {

// To generate random values from 1 to 100

const value = Math.floor(Math.random() \* 100) + 1;

// To create element "div"

const bar = document.createElement("div");

// To add class "bar" to "div"

bar.classList.add("bar");

// Provide height to the bar

bar.style.height = `${value \* 3}px`;

// Translate the bar towards positive X axis

bar.style.transform = `translateX(${i \* 30}px)`;

// To create element "label"

const barLabel = document.createElement("label");

// To add class "bar\_id" to "label"

barLabel.classList.add("bar\_id");

// Assign value to "label"

barLabel.innerHTML = value;

// Append "Label" to "div"

bar.appendChild(barLabel);

// Append "div" to "data-container div"

container.appendChild(bar);

}

}

// asynchronous function to perform "Selection Sort"

async function SelectionSort(delay = 300) {

let bars = document.querySelectorAll(".bar");

// Assign 0 to min\_idx

var min\_idx = 0;

for (var i = 0; i < bars.length; i += 1) {

// Assign i to min\_idx

min\_idx = i;

// Provide darkblue color to the ith bar

bars[i].style.backgroundColor = "darkblue";

for (var j = i + 1; j < bars.length; j += 1) {

// Provide red color to the jth bar

bars[j].style.backgroundColor = "red";

// To pause the execution of code for 300 milliseconds

await new Promise((resolve) =>

setTimeout(() => {

resolve();

}, 300)

);

// To store the integer value of jth bar to var1

var val1 = parseInt(bars[j].childNodes[0].innerHTML);

// To store the integer value of (min\_idx)th bar to var2

var val2 = parseInt(bars[min\_idx].childNodes[0].innerHTML);

// Compare val1 & val2

if (val1 < val2) {

if (min\_idx !== i) {

// Provide skyblue color to the (min-idx)th bar

bars[min\_idx].style.backgroundColor = " rgb(24, 190, 255)";

}

min\_idx = j;

} else {

// Provide skyblue color to the jth bar

bars[j].style.backgroundColor = " rgb(24, 190, 255)";

}

}

// To swap ith and (min\_idx)th bar

var temp1 = bars[min\_idx].style.height;

var temp2 = bars[min\_idx].childNodes[0].innerText;

bars[min\_idx].style.height = bars[i].style.height;

bars[i].style.height = temp1;

bars[min\_idx].childNodes[0].innerText = bars[i].childNodes[0].innerText;

bars[i].childNodes[0].innerText = temp2;

// To pause the execution of code for 300 milliseconds

await new Promise((resolve) =>

setTimeout(() => {

resolve();

}, 300)

);

// Provide skyblue color to the (min-idx)th bar

bars[min\_idx].style.backgroundColor = " rgb(24, 190, 255)";

// Provide lightgreen color to the ith bar

bars[i].style.backgroundColor = " rgb(49, 226, 13)";

}

// To enable the button "Generate New Array" after final(sorted)

document.getElementById("Button1").disabled = false;

document.getElementById("Button1").style.backgroundColor = "#6f459e";

// To enable the button "Selection Sort" after final(sorted)

document.getElementById("Button2").disabled = false;

document.getElementById("Button2").style.backgroundColor = "#6f459e";

}

// Call "generatebars" function

generatebars();

// function to generate new random array

function generate()

{

window.location.reload();

}

// function to disable the button

function disable()

{

// To disable the button "Generate New Array"

document.getElementById("Button1").disabled = true;

document.getElementById("Button1").style.backgroundColor = "#d8b6ff";

// To disable the button "Selection Sort"

document.getElementById("Button2").disabled = true;

document.getElementById("Button2").style.backgroundColor = "#d8b6ff";

}

CSS:

.mySlides {

display: none;

}

body {

background-color: #C85C5C;

font-family: Verdana, sans-serif;

}

.head {

margin-top: 20px;

margin-right: 20vw;

margin-left: 20vw;

text-align: center;

font-size: 30px;

background-color: #6f459e;

color: white;

border-radius: 19px;

font-weight: bolder;

}

.data-container {

width: 600px;

height: 384px;

position: relative;

margin: 0 auto;

}

.bar {

width: 28px;

position: absolute;

left: 0;

bottom: 0;

background-color: rgb(0, 183, 255);

transition: 0.2s all ease;

}

.bar\_\_id {

position: absolute;

top: -24px;

width: 100%;

text-align: center;

}

.btn1 {

padding: 12px;

font-weight: bolder;

background-color: #6f459e;

border-radius: 10px;

color: white;

font-size: 16px;

border: white;

margin-left: 37vw;

margin-top: 4vw;

margin-right: 1vw;

}

.btn2 {

padding: 12px;

font-weight: bolder;

background-color: #6f459e;

border-radius: 10px;

color: white;

font-size: 16px;

border: white;

}

*Chapter 6: Project outcome and applicability*

* ***Our project is an interactive platform that visualizes algorithm from code.***
* ***The project will also focus on dynamic graphics to visualize computation of a given algorithm.***
* ***The project will also exhibit new forms of design and complexities.***
* ***A sorted technique is going to be followed.***

*Chapter 7: Conclusion and recommendation*

*This program/project is to help the students by assisting their algorithm studies with dynamic visualization of those algrorithms. But because of the time limitations and the lack of experiance, this project doesn't strive to be a unique or a novel project but a humble begining by our team to further advance our skills in project developing and in the meantime help those who might want some sort of visualization in understanding the various algorithms better.*