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COMPUTER SCIENCE LAB

Table of Contents

1. Introduction

It demonstrates the development of a professional portfolio in computer science that was one of the briefs of a job application. The application of technical competency, communication skills, and creative ability in a competitive job market is one of the areas that need a well-organized and well planned portfolio in an effort to demonstrate technical competency, communication skills, and creative ability in the current competitive employment market especially in the field of technology With that in mind, the candidate was assigned the task of developing a personal portfolio that would reflect his/her technical mastery and academic experience on the one hand and demonstrate his/her abilities to work with industry-standard tools and technologies on the other hand.

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The formulation of a unified, digital representation of the skills, academic achievements and project-based work is the primary objective of the portfolio.

2. Portfolio Website Design and Implementation

The portfolio website has been thoughtfully created, arranged, and launched to provide a clear, engaging, and professional view for job prospects—particularly the hiring manager looking at the application from the working student. Besides ensuring that the website is simple to manage and can be accessed on all devices, the design and building process focused heavily on user-friendliness, adaptability, and visual attractiveness (Pierre, 2020).

a. Planning and Structure

The primary purpose of the portfolio website is to give a brief yet detailed snapshot of the candidate's technical and academic background. It is meant to show the relevant computer

science skills, education, languages, and contact information. The content will provide clear focus on relevant skills and qualifications and will follow the expectations of a technology employer. The website has been created with a specific audience in mind, which is hiring managers, who must review and assess a candidate's background quickly. Each section of the website provides the framework to pinpoint the candidate's strengths and qualities clearly and directly (Mamilov and Atayeva, 2024).

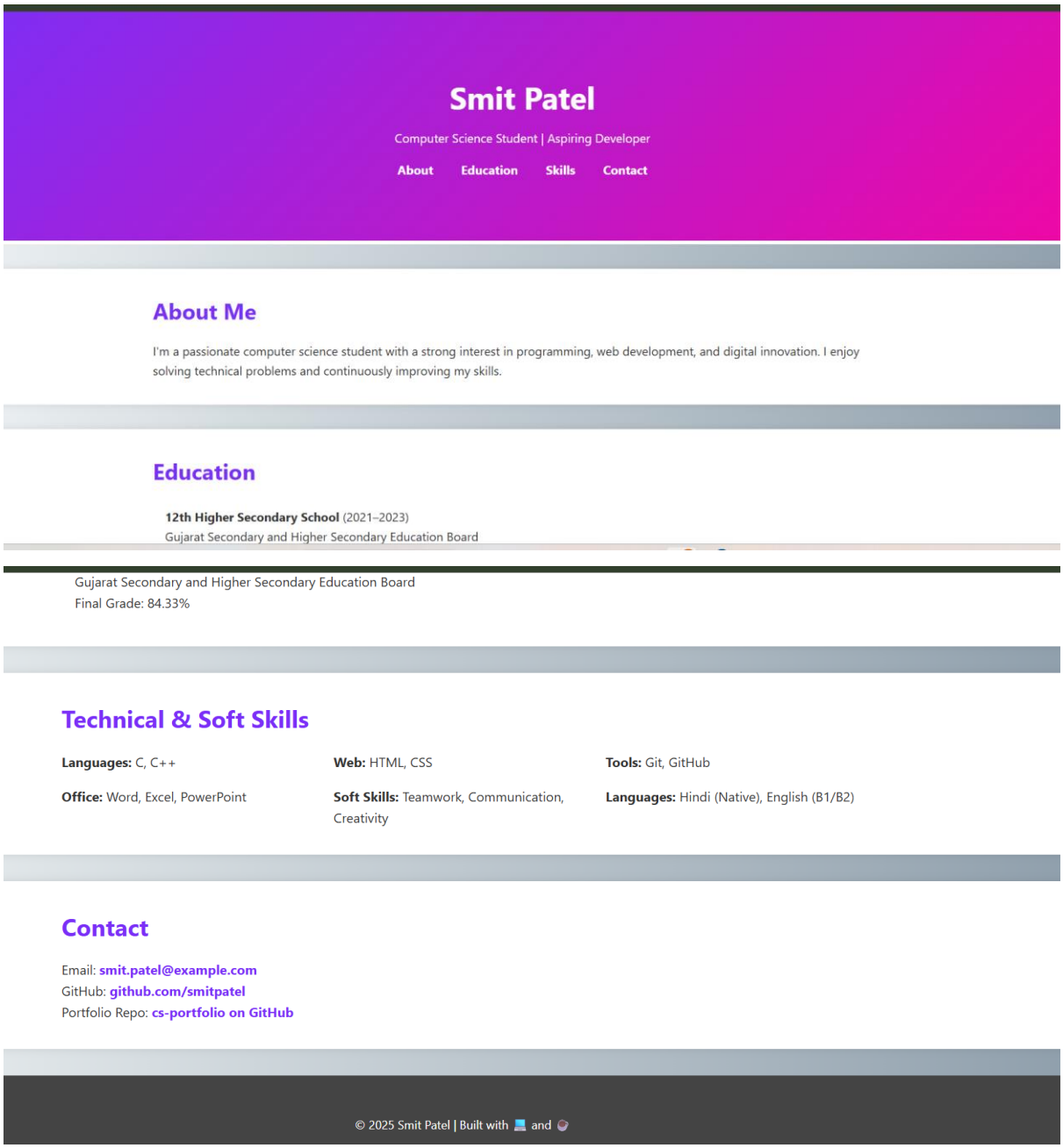


Figure 1: Portfolio page

(Source Vs-code**)**

The website has been made easy to navigate, while still guaranteeing it will be done quickly, easily, and intuitively so that people will be able to locate information easily and efficiently.

The base structure of the website is divided into the four sections below.

- About: A short personal introduction and description of motivations and goals.
- Education: Lists degrees and institutions, years in school, and academic results.
- Skills: Descriptions of both technical and soft skills, including programming languages, software tools, and interpersonal skills.
- Contact: Clear ways for the hiring manager to contact the candidate, or visit external links to places like GitHub repositories.

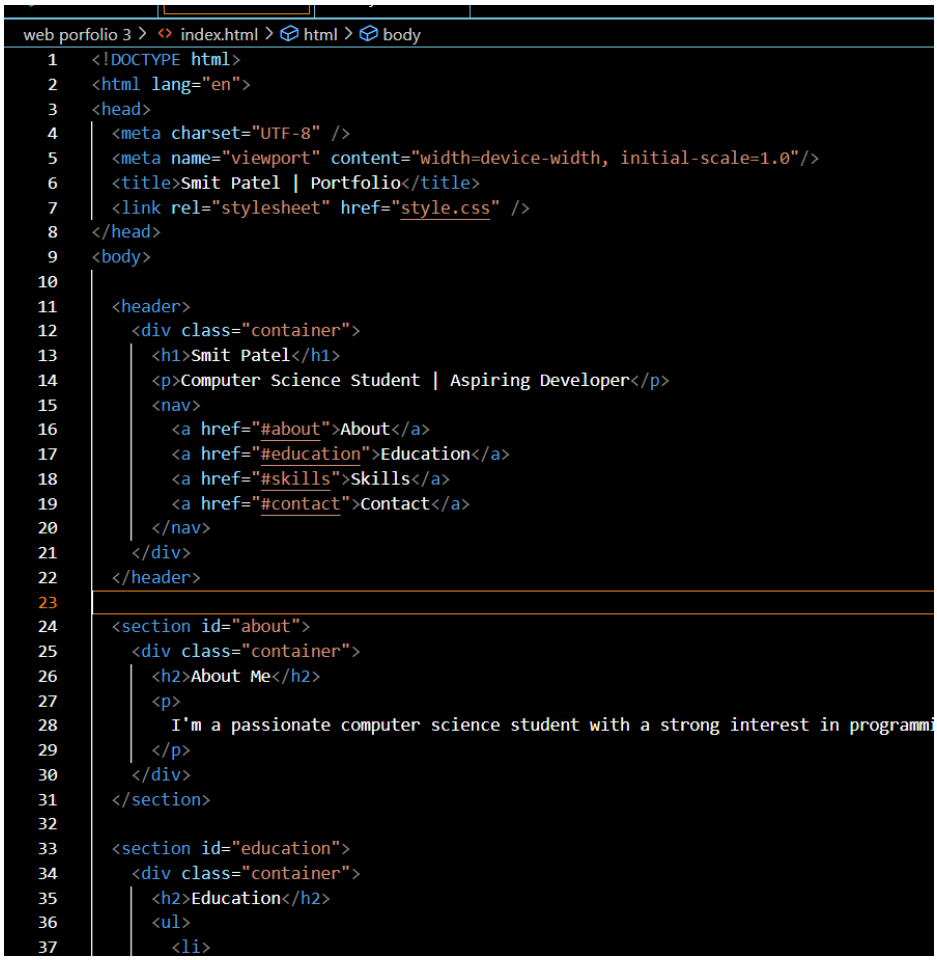
b. Design Decisions

The graphic design style of the portfolio maintains a healthy balance between professionalism and originality. The contemporary and aesthetically pleasing style produced from the color scheme consists of gradient backgrounds of bright colors, combining purple, pink, and gray tones. The use of bright, contrasting colors helps enhance readability, while also enlivening the UI.

The typographic selections based on consistent readability and visual coherence. The aim was to maintain a clean and contemporary feel throughout all portions of the portfolio (Christophers, 2024). “Verdana” and “Segoe UI” were chosen for their sans-serif versatility. Everything is designed to be responsive to desktop and mobile, ensuring a seamless experience. There is no need for a profile photo because of the page format, where the focus is on professionalism and clear text. This reflects the idea that the portfolio should speak for itself, based on technical implementation and organization, rather than visual appearance.

The addition of subtle design elements including color gradients, rounded containers, and interactive hover actions enhanced user engagement. This was done while maintaining accessibility and simplicity, to create an aesthetically pleasing user interface.

c. HTML and CSS Implementation



```
web porfolio 3 > index.html > html > body
1   <!DOCTYPE html>
2   <html lang="en">
3   <head>
4     <meta charset="UTF-8" />
5     <meta name="viewport" content="width=device-width, initial-scale=1.0"/>
6     <title>Smit Patel | Portfolio</title>
7     <link rel="stylesheet" href="style.css" />
8   </head>
9   <body>
10
11    <header>
12      <div class="container">
13        <h1>Smit Patel</h1>
14        <p>Computer Science Student | Aspiring Developer</p>
15        <nav>
16          <a href="#about">About</a>
17          <a href="#education">Education</a>
18          <a href="#skills">Skills</a>
19          <a href="#contact">Contact</a>
20        </nav>
21      </div>
22    </header>
23
24    <section id="about">
25      <div class="container">
26        <h2>About Me</h2>
27        <p>
28          I'm a passionate computer science student with a strong interest in programmi
29        </p>
30      </div>
31    </section>
32
33    <section id="education">
34      <div class="container">
35        <h2>Education</h2>
36        <ul>
37          <li>
```

Figure 2: Html

(Source Vs-code**)**

The creation of the website was done using Semantic HTML5 to ensure clear and meaningful construction. Each part is explicitly identified using semantic tags such as <header>, <section>, <nav> and <footer> in order to improve browser rendering and improve accessibility of the content through assistive technology.

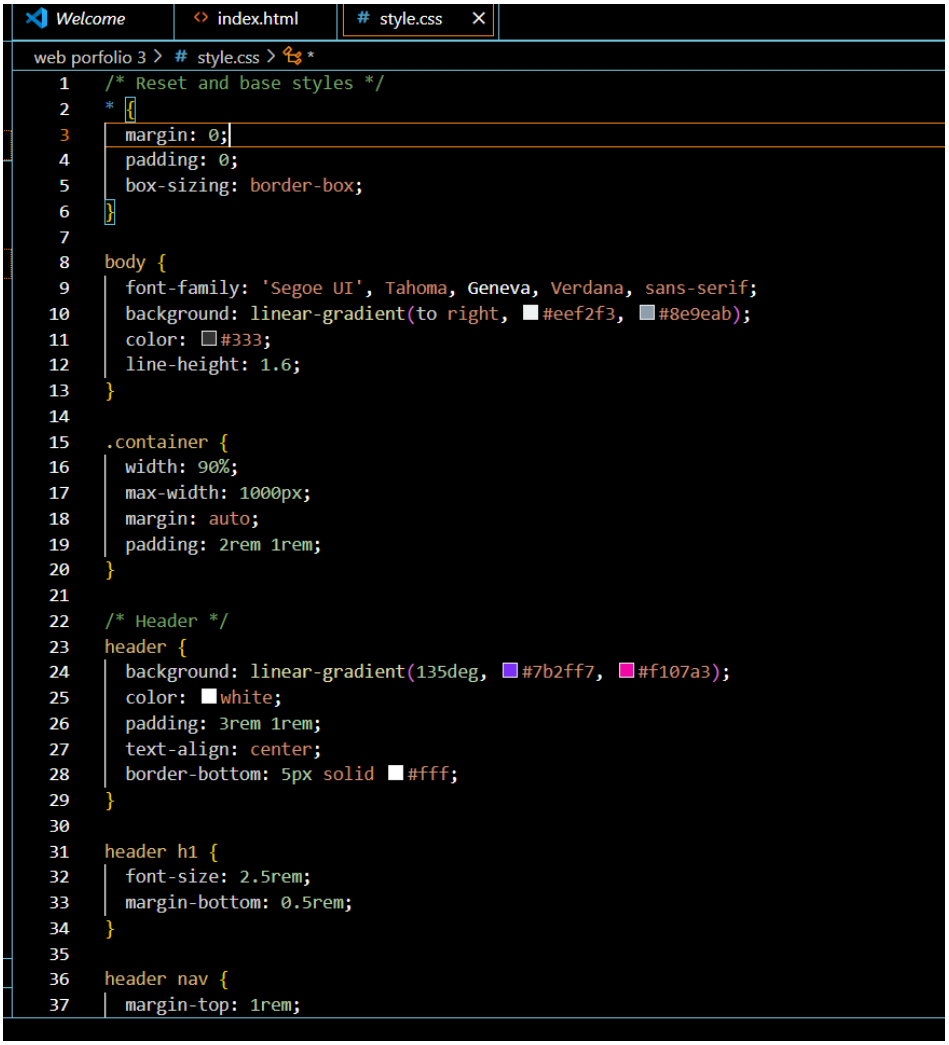


Figure 3: CSS

(Source Vs-code**)**

CSS code is taken outside to an external file with the styling, thus creating clear separation of code and making it more easy to change. The CSS utilizes modern ways of styling such as Flexbox and Grid layouts to ensure that each object aligns properly in any size of screen.

The responsive design was one of the leading priorities to be identified during the development process. Fluid layouts have been created by ensuring that content containers can scale fluidly across resolutions and media queries have also been utilized to adjust layouts to smaller screens. This will ensure the same experience on a mobile device or a desktop.

Accessibility involves a keyboard navigable layout, the use of high contrast colors and prominent differences (usually in color) of links. The site also enhances such accessibility to every user where the font size is accessible and the content format is easy to comprehend (Ferrari and Hurst, 2021).

Altogether, it could be said that the portfolio site should be described as a close attention to the aspect of proper balance between technical performance, design, and ease-of-use, which indicates the strong ability of the candidate to be both an adept of digital communication and a programmer. It is scalable, clean, and follows the current best practices of web development concerning the coding and structure.

3. GitHub Repository and Hosting

A unique GitHub repository has been created for the portfolio web site that can also serve as a hosting and storage repository. This GitHub repository includes the necessary files such as index.html for the home page, style.css for external styling, README.md for documentation, as well as c\directory for the LaTeX-generated curriculum vitae pdf file. The folder structure is clean and clear. This repository provides a structure for scalability, modularity, and usability (Escamilla *et al.*, 2022).

As for the web site launch, GitHub provides a free static page hosting service called GitHub Pages. This allows deploying a static web site without requiring a second server or domain name. The web site can be accessed using a custom URL using the GitHub Pages service hosted directly from the main branch of the repository.

Version control provides easy access to see how and what changed overtime in the repository. Collaborating features in GitHub allow for future collaboration and/or feedback if needed. The public availability of the repository promotes transparency and gives hiring managers the opportunity to see coding conventions firsthand.

4. Data and CV Creation

CV Creation: The CV paper has a tidy and photo-free format with aligned parts that have schooling, technical and soft skills, language competency, and personal information. LaTeX was selected due to being able to be used again and again, the attractive layout, and precise typography, which ensures that it is format-compatible. Ordered lines and peculiar fonts enhance readability and provide the document with a professional look. The last PDF CV is easily accessible in the portfolio since it is stored in the cv/ subdirectory of the GitHub repository. This integration provides a good connection between the presentation and content.

Data visualization

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
import pandas as pd

# Read the CSV with the correct delimiter (comma)
df = pd.read_csv("people.csv", sep=",")

# Strip whitespace from column names (if any)
df.columns = df.columns.str.strip()

# Show column names to verify
print(df.columns.tolist())
```

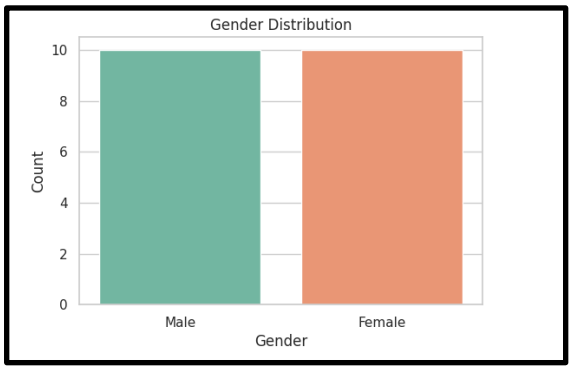
```
['Name', 'Gender', 'Skin Color', 'Height(cm)', 'Weight(kg)', 'Date of Birth'
```

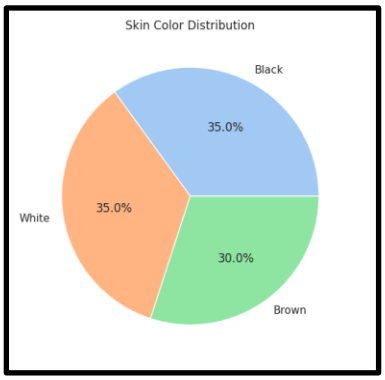
```
print(df.columns.tolist())
```

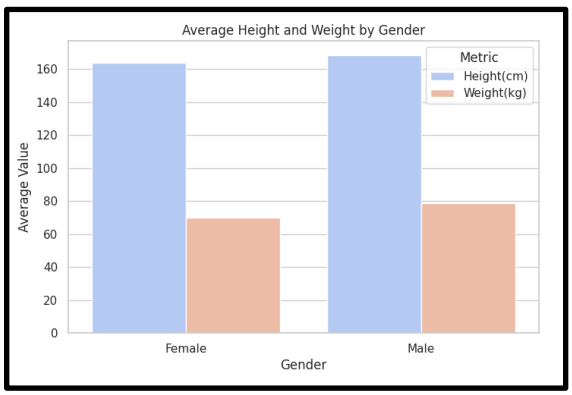
```
['Name', 'Gender', 'Skin Color', 'Height(cm)', 'Weight(kg)', 'Date of Birth'
```

```
df.head()
```

	Name	Gender	Skin Color	Height(cm)	Weight(kg)	Date of Birth
0	Michael	Male	Black	175	64	7/29/1993
1	Joseph	Male	Black	180	132	8/27/1999
2	Matthew	Male	Black	162	91	11/5/1999
3	Olivia	Female	Brown	152	47	5/14/2003
4	Madison	Female	Black	160	113	6/13/1991







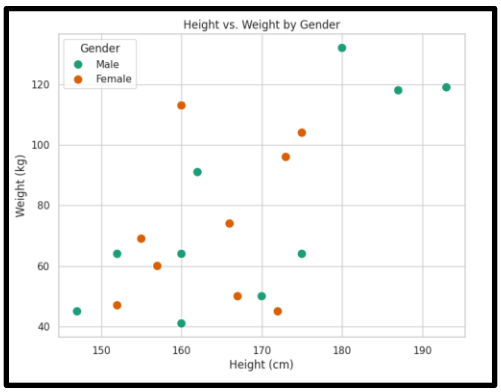


Figure 4: Data visualization

(Source Google-Colab**)**

This information was highlighted through four specific visualizations of data that not only conveyed the demographic and physical characteristics of people, but facilitated meaningful

insights. First, a gender distribution bar chart produced instant insight into gender representation by putting into context the combination of male and female participants involved. Second, an easy comparative analysis of physical characteristics (between each gender) was completed through a grouped bar chart that provided a view of average height and weight by gender. The final visualization, a skin colour distribution pie chart, described the skin tones represented in the data set and indicated the diversity that was contained. Finally, the last visual, a scatter plot of height vs weight that included gender coding, demonstrated the up take overall correlation between height and weight while revealing any potential outliers (Healy, 2024). Taken together the combined visualization suite captured a concise yet comprehensive summary of the presented information and underscored how libraries (i.e., Matplotlib, Seaborn) in Python make it easy to present data in an appealing, clear format allowing for quick identification, comprehension, and delivery in a professional context.

5. Tools and Technologies Used

Some modern tools and technologies which have been an industry standard in the field of web development and technical documentation were incorporated in the making of the portfolio site and the curriculum vitae. These tools were selected to ensure a fluent SW workflow, high-quality output by the experts, and management of versioning in an efficient way.

HTML5, the current standard of the semantic web markup, comprised the foundational structural layer of the portfolio website. HTML5 assured a reasonable ordered style, which was easily navigable for the portfolio website. With semantic tags, HTML5 allowed for the appropriate "keywords" in the header, navigation bar and content to be more readable, and better optimized for search engines.

Styling was through CSS3, an efficient and visually appealing style. CSS3 offered flexbox, gradients, media queries and integration of custom fonts to help ensure that the website functioned and looked good with various screen sizes (Dean, 2025).

The project utilized GitHub for version control through the project's lifecycle, offering effective code and group management. GitHub Pages is also a free and reliable static hosting service that offered very little set up to make the portfolio available to the public. The repository has a README.md file that is well documented for clarity.

The CV was prepared using LaTeX through the Overleaf platform. LaTeX was chosen for its professionalism and precise formatting. LaTeX was ideal for a clean, organized curriculum vitae because it offered defined sections, consistent formatting, and high-quality output.

Visual Studio Code, known widely for its adaptability, served as the main tool for writing and changing the code for the website. At the time while working on it, tools built into the browser were utilized to improve performance, check responsiveness, and resolve issues.

Python was employed to showcase skills in a way that goes beyond just presenting fixed information by including interactive data visuals and analysis (Lavanya *et al.*, 2023).

6. Reflection and Evaluation

It can be seen that a lot of hands-on experience in web development, version control, and technical documentation have been picked up from creating the computer science portfolio. Along with the limitations, various strengths were identified throughout the project. Improvements were also proposed to enhance the quality of the portfolio and make it more engaging.

a. Strengths: One of the portfolio's main strengths is its simplistic and professional design. The portfolio uses a minimalist design with bursts of color, which is bolstered through the use of gradients and card-based designs; it creates a pleasing visual layout that doesn't alter the clarity of the visual information. The layout also ensured that the hiring manager could quickly look through the resume of the applicant because the layout was organized, which ensured the information was displayed clearly and succinctly.

The design of the portfolio is completely responsive, allowing it to load well on a variety of devices, from a desktop computer to a tablet to a smartphone. Regardless of screen size, the responsiveness of the design further enhances usability by making it more accessible and providing a consistent experience for the user. There are clearly marked sections away from anything distracting, and its intuitive layout made navigation easy. This usability was in-keeping with the expectations of a professional design. The ability to grow and the ease of upkeep are two additional important benefits. By separating HTML from CSS, it's easy to quickly change styles or content, and the structure hosted on GitHub allows for good management of versions. For users needing downloadable or visible qualifications, the way LaTeX CV is included in the portfolio and repository adds even more professionalism and ease.

b. Weaknesses: The current version of the portfolio has a lot to offer, but there are also many weaknesses. The site is lacking client-side programming such as JavaScript that may allow for more sophisticated user experiences and has almost no interaction. In addition there is not very much dynamic content—the data is all static and does not change over time, nor does it pull anything in from another source. It is possible that the absence of a backend could mean a lack

of features such as contact forms and other interactive pieces. For consumers anticipating more advanced functionality, or two-way contact using the website, this may be seen as deficiency.

c. Future Improvements: In the future, the aim includes multiple improvements to enhance the engagement and functioning of the portfolio. Adding a Projects section that retrieves repositories using the GitHub API to update the portfolio with project contributions is one of the top priorities.

JavaScript methods will allow to include features that lead to more interaction like interactive pieces or dynamic skill bars (Henninger *et al.*, 2021). An option to download a CV will be made available for users. Finally, to evidence writing skills and provide content on technical subjects and learning opportunities, a dedicated blog or article page may be offered.

7. Conclusion

In conclusion, Smit Patel developed a professional portfolio in computer science that interconnected three distinct yet complementary projects: a resume created with LaTeX, a repository hosted on GitHub, and a responsive HTML/CSS website. By emphasizing his technical capabilities and attention to detail, this portfolio was especially tuned to facilitate an application for a working student position. In doing so, the candidate could demonstrate that they attained all of the essential competencies required by working to a professional standard on this project: web programming, version control using Git and Github, and preparation of technical documents using LaTeX.

The end effect of this final result should be one that impresses upon recruiting managers and showcases a delicate balancing act between professionalism and simplicity. The experience of designing and developing the portfolio also helped the candidate to gain a better awareness of industry resources & gave him an opportunity to practice in producing and presenting digital information in an effective way. This project also boosted the confidence of the candidate when applying to the working student entry since it enabled the candidate to show an ability to handle technical tasks on his own and manage to deliver high-quality work in a well finished manner. Having already a sound foundation, there is a lot of room to grow in the future, like interaction, more material and continuous addition to the projects and learning.

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https://www.overleaf.com/7545492474wwfkxxmhjjgt#d04f08

https://www.overleaf.com/read/fbjbvqhjrwvc#49daa1