

Software Project

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Software Project

Sign Language Website

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DL836 BSc (Hons) in Creative Computing

Link to resources created as part of the project.

|  |  |
| --- | --- |
| GitHub | <https://github.com/y2-SW-project/swproject23-RiddleASL> |
| Miro | https://miro.com/app/board/uXjVPsp045g=/ |
| Figma (project) | https://www.figma.com/file/BYzbT3Zel5mN2u71sf5khI/Untitled?node-id=0%3A1&t=Z0WMyHIzGGEftQob-1 |
| Video | (to be recorded, check figma for video if not here) |

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# 1 Introduction

Application area

Technologies

PHP, MySQL, Bootstrap, CSS, Vanilla

Tools

IDE, phpMyAdmin, Miro

Project management

GitHub

Business Concept

Requirements

Design

Implementation

Testing

Reflection

# Business Concept



## Business Idea

For my Software Project I had made the initial decision to create a website based around the idea of a community run Sign Language website. Using this, people will have the ability to select the Sign Language of their choosing, look up words and get videos of Deaf/Hoh/Fluent members performing the sign, research into the languages culture and history, interact with other users via forums, find extra external sources of information as well as join communities on social media (Facebook, Discord, Reddit, Etc.).

Upon further examination of time constraints in combination with learning web development at the same time, all my ideas were out of scope given the time frame. With this, there was decided to push my business idea to an American Sign Language website called SignField with the main functionality focusing on the word bank so users can learn vocabulary.

## Business model

For this website, if given more time to develop, the plans on gaining revenue based off donations from the general public as well as advertising. With advertising we will outsource to D/HOH people who wish to advertise their stores on the website and generate revenue based off how many clicks the website gets. This would be optimal as it would allow Sign Language based products made and produced by D/HOH people to be advertised.

## Market Research

There are plenty of people, from the general public to students, who are constantly looking for new resources to increase their understanding of sign language, vocab and culture from reliable sources. This would be ideal as it would be sourced from D/HOH instead of spreading by someone who is hearing.

## Marketing/Advertising

Sign Field could be advertised via social media such as Instagram, Reddit, Discord etc. This would allow people who use these kinds of research tools to the daily. With the idea of allowing people to advertise their own stores it would be a big sense of community as they sell

## Suppliers

With the website, there plenty of resources publicly available for use to supply the website. These could range from volunteers to D/HOH employees who are willing to record and contribute to the word bank for a Sign Language. When it comes to marketing, there are a lot of already existing D/HOH run stores that I could reach out to and ask if they wish to support by advertising their site.

## Competitors

In terms of competitors, even though this is less of a competitive market and more an educational based application, there are other places that people can use to teach themselves the culture and language, but in the future would like to work alongside these people rather than against. Potentially adding their pre-existing words/videos alongside this website.

## Employees

When it comes to front-end/back-end/software wise, anyone could work within the website. If it concerns the community within the forums, if it concerns questions about culture or history it would be answered by a D/HOH person, if concerning a word that they wish to know it would be answered by anyone with the necessary qualifications and knowledge.

# Requirements

## Introduction

This section should hopefully describe the requirements that I see fit for this website. Initially, the requirements were as follows:

* Going over what the admins should have control over, can view and edit as well as what the public users are allowed to view and what actions they can perform.
* Being focused on a language that is a primary form of communication for a population of people, the main importance is that we are accurate, up to date and all the statements are true.

However, with further review and realizing the scope, the requirements have been updated to as follows:

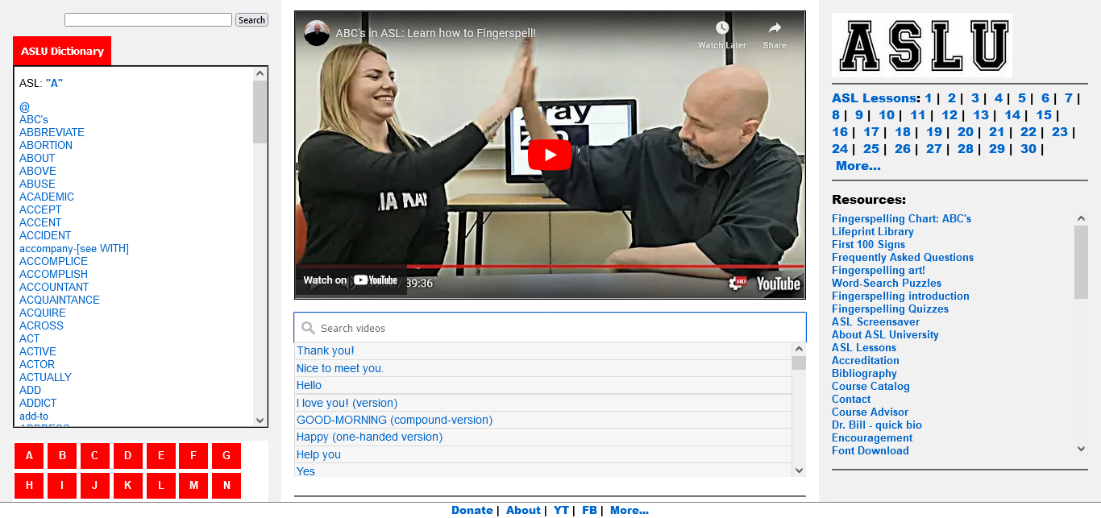
* Admin/User accounts are optional. Allowing for guest users to view and learn without pressure of registration.
* Up-to-date and reliable signs for words given.
* Allowing users to view external resources for more topics (History, Culture, Etc.)

## Requirements gathering

### Similar applications

First, we will look at the two main sites I and countless others have used for by students and the public to research and learn American Sign Language (ASL).

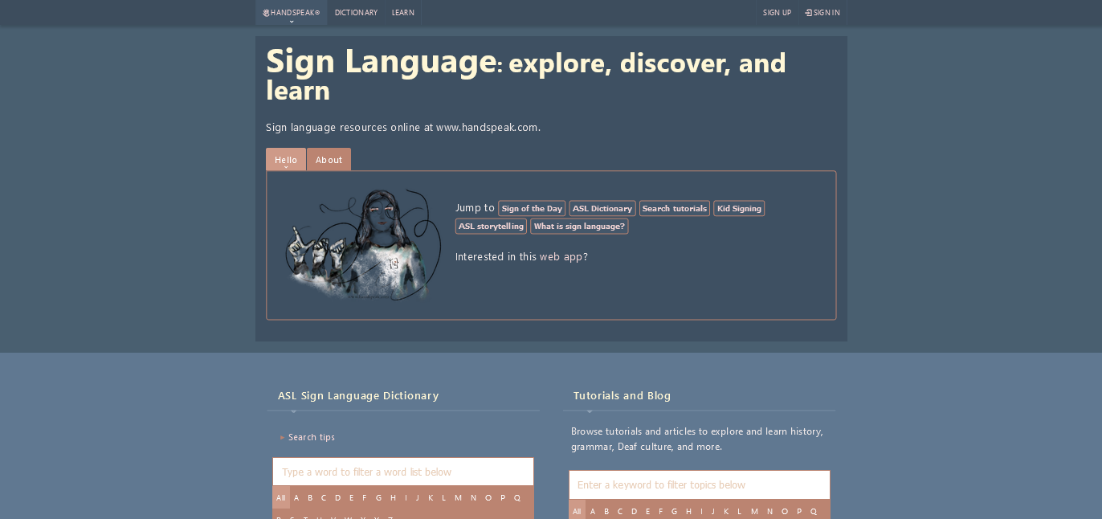
**Lifeprint** [**(https://www.lifeprint.com/)**](https://www.lifeprint.com/)



Lifeprint is an independent site run by deaf ASL lecturer Bill Vicars. Bill has been supplying free resources that the public can look at for years. Well known for his YouTube channel with 40-minute-long lessons going from the bare basics to advanced vocabulary, also owns this website that anyone can use to learn and follow along with the videos. While a lot of what I wish for my website to become is like his, I want to point out disadvantages and advantages I can see.

|  |  |
| --- | --- |
| Advantages | Disadvantages |
| * Free resource that anyone with a Wi-Fi connection can access and learn from. * Vast vocabulary and lessons on rules with lots of detail * Can ask personalized questions with quick response times via email. | * The site is old and dated. Even as a user for over a year, I struggle sometimes to navigates * The webpages are all very wordy with little indication to show where your eyes go |

**Handspeak** [**(https://www.handspeak.com)**](https://www.handspeak.com)





Handspeak is a Deaf run website by a born deaf woman, Jolanta Lapiak. The website runs similar to Lifeprint but as you can see is considerably more modern. Providing similar options to learn grammar, culture, history and the language itself. It is another free resource that is popular amongst the Deaf and Hearing community.

|  |  |
| --- | --- |
| Advantages | Disadvantages |
| * It is very simplistic making it easy to navigate. * The descriptions to the sign you click on are well put and allow you to navigate to signs that look similar or have similar meaning | * Some videos are outdated/corrupted so they no longer play * The color selected for the links is a pale beige/red which makes it very hard to differentiate between normal text and clickable text |

### 

### Interviews

Over the weeks, we had conducted interviews with close friends. A total of 4 people were interviewed. 2 of which identified as Hard of Hearing and considered themselves involved in the Deaf community. The other 2 were hearing and have been learning for more than 4 months each.

Some similarities that are note between all interviewees:

* Current resources are old looking.
* Accuracy of information is crucial.
* Constant input from Deaf people is important.
* Easy to use websites make it more likely to be used in the long run.

During the process of this project, these 4 people were constantly asked for inputs on design and functionality and have been a fundamental part to this process.

## Requirements modelling

### Functional requirements

In this website you should be able to search up a word and if that word exists in the collection of signs, be shown a video and definition of the word you selected. All the signs and definitions should be accurate and up to date with the word being viewed by the user

You should be able to view Deaf history and Deaf culture. Included should be external resources to view these with more accurate information from a Deaf persons perspective to keep accuracy of information at a maximum

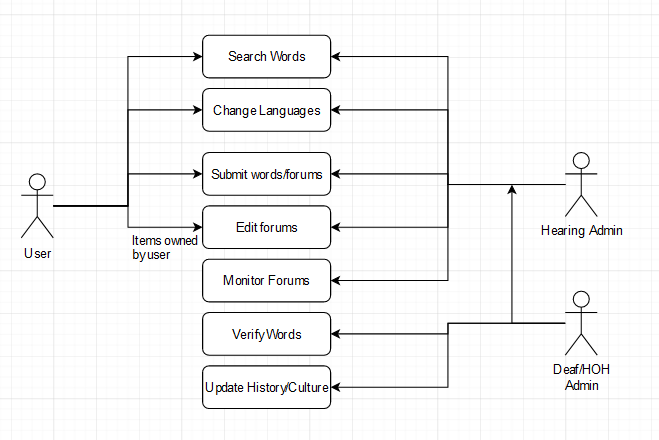
If given enough time, the user should be able to submit videos and forums that allow for community run word bank and forum. This allows the community to be self-sufficient with admins to confirm and verify new words and that the forums are user friendly and regulated by rules set upon the sites launch that users must agree to before posting.

### Non-functional requirements

For usability purposes, the website must be as user friendly as possible to ensure that the user gets the results of their question as quickly as possible. This would mean looking at the site as a whole and questioning where we can and can't minimize actions to achieve the goal. Security is not the largest but it is still important as we want the information to be as accurate as possible.

### Use Case Diagrams

In this section you should hopefully gain a better grasp on how Admins and Users interact with the web page. Below you will see the initial concept. However, while outdated, it still provided the stepping stone to what the website will become and hopefully could become given time.



Below you should now see a more up to date and accurate representation of actions Admins and Users are permitted to do as well as expected permissions.

Diagram

Description automatically generated

## Feasibility

During the development, plans on using Laravel as the backend framework and Bootstrap as the frontend framework were set in place and used as our main development tools. With the use of Laravel, access to Blade allows quick webpages to be designed, Breeze allows quick authentication capabilities and Laravels MCV is intuitive with practice. Bootstrap, while initially was not very intuitive to implement, once implemented was easy to work in tandem with Laravel.

# Web application Design

## Layout

The layout for this application will be dependent on bootstrap for its responsivity. This is a very important part as I want the site to be readable upon mobile devices and monitors regardless of the screen size. To achieve this we will be using Bootstrap paired with SCSS to get responsive and good looking layouts.

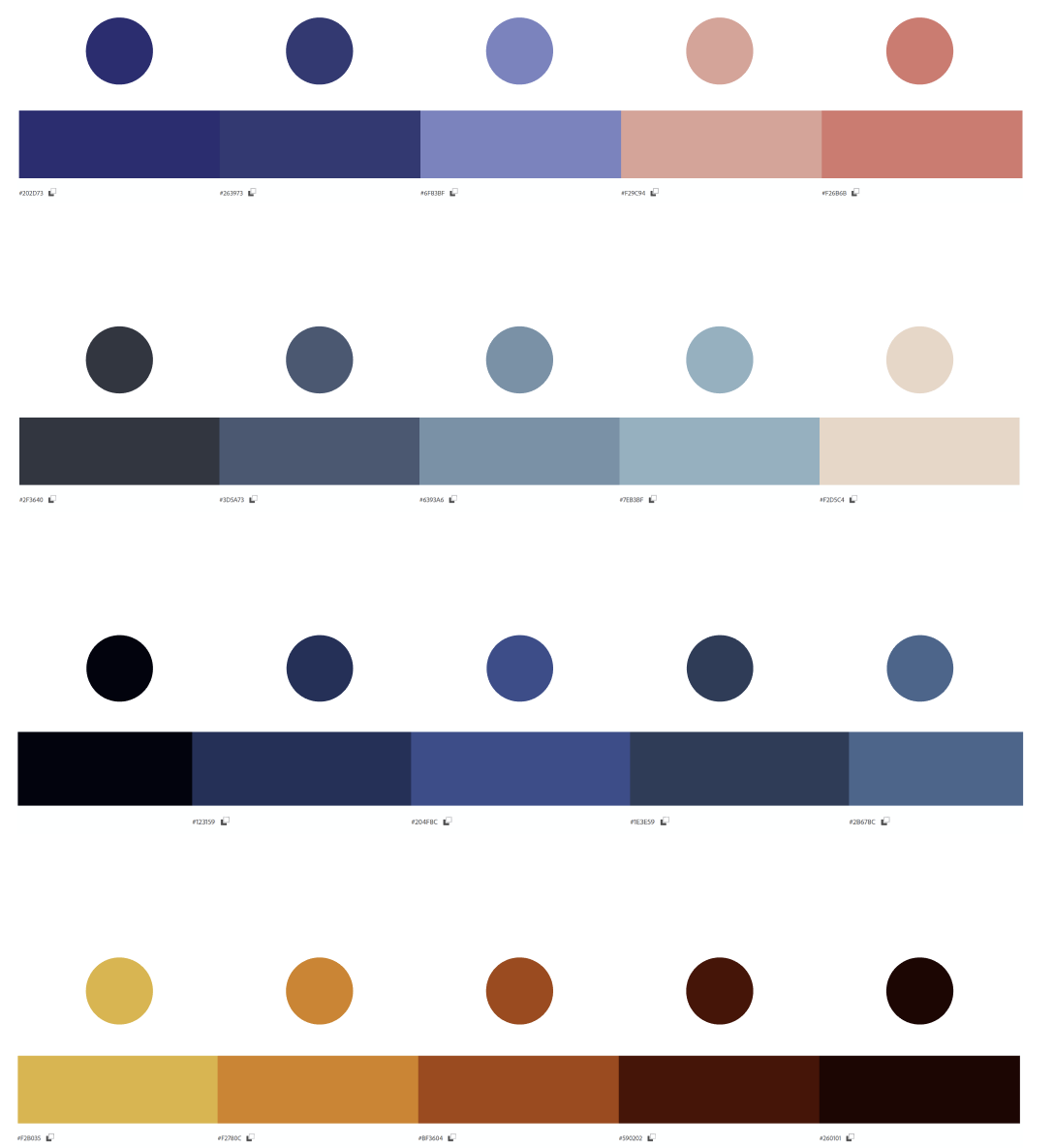
## Interaction

The interaction between the user and the application will be mainly within the search of the word bank. Allowing the user to search for words, the database gives a list of available words and once upon clicking, the user will be sent to a page with signs related to the word being easy to view. If the word is not available/validated, it will not show. If the word does exist but is yet to be validated, administration can distinguish between the two via text color.

In the future, with more time, Users may also be allowed to submit forums and advertise products sold by them is the advisory teams allows It. This gives the site a bigger sense of community as well as allowing the window of potential monetary income from advertising slots.

## Color schemes

This section will go through the research of color schemes which was used and went through before landing on my final decision.



While looking across for comforting color schemes, there were a few which caught the feeling of the website better than others. While wanting to keep a cool calming color to make it less stressful for users to use, it was advised to have a contrast color to be used to point out important information. The final color scheme was decided as the top row on the image above.

## Font choices

With such a large array of font choices with so many uses, it was important to take time and think of this decision as it could possibly ruin the experience if not readable. Due to this I chose to stick to two fonts. Opens sans, as it is simplistic, modern and readable, and Playfair Display as it allows for emphasis on quotes or citations.

Examples of the Open Sans would be like body text, most likely to be views in the definitions of words when shown the signs. Example use of Playfair would be when emphasizing a quote or the word the user is looking at. An example definition like shown below (Screenshot from Merriam Webster.):



## Wireframes

Here, we hope to show you how the user can look at the home page and word bank view to get words they wish to learn. First, the home page. Please view the image below.

Graphical user interface, diagram

Description automatically generated

In the home page, the user will be welcomed, be able to log in as well as quickly view all the functionality of the page with a single glace of the page. Please note, in the final product due to scope, the language dropdown button seen at the top right was removed.

Next, I would like to show the word search page. Please view the image below.

A picture containing diagram

Description automatically generated

Hear the user would be able to search words. If the word was available, it would appear as white text that the user could click and be sent to the page of signs related to that page. As you can also see, this page is also used to quickly inform users brief history and information on Deaf Culture.

# Database Design

## Description

This website is structured around the concept of using a word bank and being able to swap languages, therefore it would be necessary to have a database for all the videos and pronunciation. For each word, it would need to display the word, definition, pronunciation, video and uploader. The database would keep track of all the words added and updates if necessary. Users won’t be required to log in to view or change languages but Admins would need a Username, Password and Security key to login and create/update/delete words when needed.

## Business Reporting Requirements

Here I will describe the required actions that users and admins should be able to always have access to.

1. Admins need to be able to Create, Read, Update and Delete words/videos/definitions/etc.
2. Users need to be able to view all words available in the wordbank.
3. Users may search up words
4. Users need to be able to swap languages whenever they wish
5. Users need to be able to view the History/Culture of the language they have chosen at all times
6. Users may need to find words based of a few letters rather and the full word

## Textual Representation of Dataset

(Please assume every piece of data has uuid’s, date created and uploaded)

**WORD** (word, info, show)

**SIGN** (video, definition, pronunciation, extra)

**USER** (name, email, password, isAdmin)

**WORD\_USER** (word\_id, user\_id)

**WORD\_SIGN** (word\_id, sign\_id)

## Business Rules

A **Word** can have many **Signs**.

A **Sign** can only have one **Word**.

An **Admin** can have many **Words**.

A **Sign** has one **Video**, **Definition** and **Pronunciation**.

A **Word** has one **User** (uploader).

## Entity Relationship Diagram

Find below, a representation of the ERD for this application.

Diagram

Description automatically generated

## Tables

Find below and image representation of the tables used in the applications database.

Diagram

Description automatically generated

## Database Dictionary

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table | Attribute | Datatype | Range | Required | PK/FK | FK Ref Table |
| Words | id | int | 7 | y | PK |  |
|  | word | string | 255 | y |  |  |
|  | info | string | 255 | y |  |  |
|  | show | Int | 1 | y |  |  |
|  |  |  |  |  |  |  |
| Signs | Id | Int | 7 | Y | PK |  |
|  | Video | String | 255 | Y |  |  |
|  | Definition | String | 255 | Y |  |  |
|  | Pronunciation | String | 255 | Y |  |  |
|  | Extra | String | 255 | N |  |  |
|  |  |  |  |  |  |  |
| Users | Id | Int | 7 | Y | PK |  |
|  | Name | String | 255 | Y |  |  |
|  | Email | String | 255 | Y |  |  |
|  | Password | String | 255 | Y |  |  |
|  | isAdmin | Int | 1 | Y |  |  |
|  |  |  |  |  |  |  |
| Word\_user | Id | Int | 7 | Y | PK |  |
|  | Word\_id | Int | 7 | Y | FK | Words |
|  | User\_id | Int | 7 | Y | FK | Users |
|  |  |  |  |  |  |  |
| Word\_signs | Id | Int | 7 | Y | PK |  |
|  | Word\_id | Int | 7 | Y | FK | Words |
|  | Sign\_id | Int | 7 | Y | FK | Signs |

# System Design/ Architecture Overview

* 1. Introduction

In this section hope to describe the internal functionality of the web framework that has been chosen. In this case, Laravel. Please look at the sections below for more detailed views into the internal functionality.

* 1. Model View Controller

In the application it used the MVC pattern. Having Models for tables the users and admins interact with such as Words and Signs. Views that allow for interaction between the website and database like the admin Create Page or the Registration Page. Finally the Multiple controllers used that solidify the connection between the Webpage and Database.

* 1. User Authentication

While at first User Authentication was a long and tedious task requiring extra tables, controllers and duplicate views. During the development of the web-app, it was realized that the use of a simple isAdmin checker via Laravel Breezes Middleware Authentication, it would allow for quicker development of webpages with the same amount of functionality. Reducing redundant code. In this web-app, the user is identified as an admin via a variable within the database called ‘isAdmin’. Depending on if the user is an admin, certain aspects of the page are hidden and certain pages are restricted.

* 1. Routing

Routing refers to the connection between your webpage and controllers. The SignField web-app uses multiple routes depending on authentication requirements, functions being used and more. Luckily with the help of Laravels resource controllers, it allowed for the creation of CRUD functional routes to be made withing a single line of code. While an understand of how the routing was required, Laravel documents were helpful.

* 1. Templating

Chart

Description automatically generated

# Testing

* 1. Introduction

In this chapter, you will be walked through the testing which was performed to ensure users could use the web-application with ease, follow instructions to goals with little guidance and test CRUD functionality. Bellow you will find the results.

* 1. Testing

This section describes the functional tests which were carried out on the app. These functional tests can be categorised as:

* Login/Registration
* Navigation
* CRUD

For testing, Navigation and CRUD were combined as one.

* + 1. Login/Registration

Test 1:

User was instructed to register with their name, random valid email address, password of password.

Expected outcome was a valid User.

Outcome matched what was expected.

Test 2:

User was instructed to register with passwords that differed.

Expected outcome was to see an error preventing creation.

Outcome matched what was expected.

Test 3:

User was instructed to login with their valid account they had registered with.

Expected outcome was to login without error.

Outcome matched what was expected.

* + 1. Navigation + CRUD

Test 1:

User was instructed to find their way to the word bank and search up the word Hello

Expected outcome was user to find their way easily and the word Hello appear if available in database.

Outcome, user found their way with ease.

Test 2:

User, logged in as admin, was to create a new word to be added to the database via CRUD, upload it as unvalidated. Later edit the word and validate.

Expected outcome, User find ‘Add Word’ Button and enter in data of their choosing.

Outcome, User didn’t understand if info was required at first. Said instructions were not very easy to follow.

Comment, In future, the use of an red asterisk allows user to view what is/isn’t expected.

Test 3:

User, logged in as admin, was to add a sign to the word they created with a valid youtube video, definition and pronunciation.

Expected outcome, video is to be working on word page, all input data displayed

Outcome, User found it hard to know if youtube link required beginning of url. Videos and data displayed normally

Comment, Add placeholder text to allow user to know what to add

### Discussion of Functional Testing Results

From the tests conducted, while most of the issues were simple overlooks during development, it did highlight how different users viewed the problem. Some found adding words difficult, others didn’t enjoy the feeling of the forms and some understood navigation and CRUD better than the rest. Over all, with the results, the changes that were seen necessary were made.

# Project Management

## Introduction

This section will highlight how this project was managed in the long run. Balancing the responsibilities of frontend, backend and design at the same time, while also preparing for user and functionality tests.

## Project Phases

Here are some key phases during development. These will be used to highlight any major bugs or issues during that specific phase.

### Requirements

The biggest issue during the requirements phase was the understanding of the scope. At beginning the web-application was wanting to be developed as this multi-language website that anyone can post forums and extra stuff. Understanding the scope later in the journey helped realize how little chance that would be accomplished so having to rewrite the requirements was necessary.

### Design

While design wasn’t the my strong suit, the final design is enjoyable, color palate is pleasing and I personally find it nice to use.

### Implementation

By far the most strenuous part of this project. The implementation of Laravel was hard and took a lot of research before I could say I felt confident. Luckily I had people I could ask and resources I could use to help but the process was still a long journey. In future, I feel more confident implementing a MVC pattern over all.

### Testing

Testing took a while to find people who were free and willing, was one of the more relaxed portions of the project. People who performed the tasks gave helpful feedback that I feel helped the final product.

## Project Management Tools

### GitHub

For the project, GitHub was used as a repository for easy uploading between home and college computers. This made it easy to track what was needed and what was still due.

# Reflection

## Your views on the project

Personally, while I do not enjoy frontend and enjoy backend even less, I did learn a lot. Being able to ask the correct questions due to more experience as the project went on made finding the right answers quicker. By the end, feeling confident enough that if given a week extra I could implement a simple forum system that allowed people to create forums and communicate between one another.

## How could the project be developed further?

If given lots more time, this could become a multi-language sign language resource. If given the same time with the knowledge I know, it could become an even greater web-app with even more functionality.

## Assessment of your learning.

One part I feel confident in saying I learned a lot in was the Laravel MVC itself. Being able to use routes, controllers and views confidently makes the process of creating CRUD functionality faster in the long run.

If I were to improve in something it would be time management. While I got what I aimed to do, I feel like I stressed myself out more than necessary. If managed in a better manner I could have avoided unwanted stress and found the process even more enjoyable. That’s something I will be working on for future projects.

## Completing a large software development project

From this project I truly learned how to find well written resources on problems. Learning the correct language and terminology as I went along. While knowing a language like PHP with the use of Laravel is nice, being able to speak the language in the correct terms was even more helpful.

## Technical skills

With this, I learned the proper way of implementing a database, ways to test functionality that show errors I wouldn’t have seen and learning when to step back and restart when necessary.

## Further competencies and skills

In the future, I would like to be able to use LinkedIn Learning a lot more to learn what im specifically looking to learn. While I used it at the beginning, I found the resources too long for me to digest and truly understand while shorter, 1 hour courses online at 2x speed, while sounding chaotic, allowed me to digest a lot of information and learn a lot.

# References

Laravel Docs: <https://laravel.com/docs/10.x/installation>

Stack overflow: <https://stackoverflow.com/>

Handspeak: <https://www.handspeak.com/>

LifePrint: <https://www.lifeprint.com/>

Illustrations for Design: <https://designstripe.com/>