## horizontal line



Software Engineering Documentation

07/30/2020

**─**

Chloe Solis

SWAU

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Proposal

# Overview

The Southwestern Adventist University website has a lot of good things and very good functionality, but when one is looking at going into a specific field of study (e.g Computer Science), one likes to have all of the information presented to them as easily as possible. When going through the Computer Science pages on the SWAU website, there is quite a bit of jumping back and forth between pages, and you have to click through menus to be able to see the Computer Science options in the first place.

My goal is to create a small web-based program that gives potential incoming students all the information they will need about Computer Science in one place in a easy to follow text guided “story” using Twine as the base.

# Project Goals

1. Have all relevant information about Computer Science as offered by SWAU
2. Have it be desktop, tablet, and mobile friendly
3. Include student interviews
4. Must be easy to navigate backwards and forwards
5. Must be simple to add information as needed
6. Must have code that others can understand

# Obstacles

Some obstacles will be presenting the information in an easy to understand way, and make the story path easy to follow. I will be using Twine 2.0 Harlowe 2.1.0, and Twine does not offer mobile applications, at least not for iOS.

## Technical Obstacles

Twine Harlowe does allow for CSS and Javascript editing, as well as a GUI, but it is not the most customizable option available.

Another obstacle is technical/personal. I have not worked with CSS and website building in a few years, and haven’t had to create one that is mobile friendly. Integrating mobile with such a technology restriction will be interesting to overcome.

Another interesting thing about Twinery is that it does not always autosave, and there is no login or sign up. Twine relies on you backing up your own stories. As soon as the window is closed or the cache cleared, all data will be wiped and you have to re-upload your saved files or archive.

# Requirements

## Technological Requirements

### Hardware

A computer with either Windows 10, MacOS, or Linux.

A smartphone and/or tablet to ensure it works on mobile.

### Software

Twinery software, either using the browser version or the downloadable software available on their website

## Non Technological Requirements

Information must be presented as simply as possible

Needs to look aesthetically pleasing to the users

User cannot modify the information

Information receives updates as needed

# Milestones

1.1 Analysis and Design Stage

1.2 Architecture Design

1.3 Research

1.3.1 Reading Twinery 2.0 Harlowe 2.1.0 Documentation

1.3.2 Finding what CSS is compatible

1.3.3 How to make it mobile friendly

2.4 Sketch basic storymap

2.5 Gather Information Needed

2.5.1 Info on SWAU’s website

2.5.2 Info about Computer Science

2.5.3 Info on Careers for CS

2.5.4 Student/Alumni Interviews

2.6 Revise storymap

3.1 Creating the “Story line”

3.2 Feedback

3.3 Patching and Fixing

3.4 Testing/Feedback/Patch (Loop until satisfied and goals are achieved)

4.1 Deploy

Note: There will be client/stakeholder meetings throughout the process. Meetings/communications will all be done remotely due to COVID-19 CDC precautions.

# Risks

Not finding out how to make it mobile friendly

Typos (twine has no autocorrect feature)

Forgetting to save my work

# Budget

## Time

This semester, during conscious hours.

## Money

None. Zero money

## Risks

Monetary budget risks: none, because zero money

Time budget risks: Trying to balance other classes and projects.

# Approximate Timetable

**Bold** *dates are the done by dates. Interviews will be added as responses are received, and will be added at any time before Aug. 11*

1.1 Analysis and Design Stage

**6/30/2020**

1.2 Architecture Design

**7/1/2020**

1.3 Research

1.3.1 Reading Twinery 2.0 Harlowe 2.1.0 Documentation

1.3.2 Finding what CSS is compatible

1.3.3 How to make it mobile friendly

**7/8/2020**

2.4 Sketch basic storymap

**7/10/2020**

2.5 Gather Information Needed

2.5.1 Info on SWAU’s website

2.5.2 Info about Computer Science

2.5.3 Info on Careers for CS

2.5.4 Student/Alumni Interviews

**7/17/2020**

2.6 Revise storymap, expand as needed

**7/19/2020**

3.1 Creating the “Story line”

**7/26/2020**

3.2 Distribution to Stakeholders & Feedback

**7/28/2020**

3.3 Patching/Fixing/Adding

**7/31/2020**

3.4 Testing/Feedback/Patch (Loop until satisfied and goals are achieved)

**8/5/2020**

4.1 Deploy

**8/9/2020**

# 

# Stakeholders

**Stakeholders are chosen based on relevance to the project. Factors taken into picking stakeholders include: age, college experience, familiarity with HTML, if I know them, if they are unbiased in opinion and not afraid to criticise me.**

**Some Stakeholders are non-SWAU, non-Computer Science persons. This is due to the fact that I want stakeholders with no previous knowledge or experience of SWAU’s presentation of their CS department on their website. If the stakeholders can understand the given information and navigate with ease on browser and mobile, then I will have succeeded.**

**There will be a few anonymous SWAU students who are also stakeholders as well.**

## Stakeholder List

Amber Brown

Alexia Evans

Evan Paulden

Bryan Roth

Aaron Vaughn

Myself

Alyssa Solis

Misc. current SWAU students

## Actors & Goals

* Admin: Updates and manages information and storyline
* New User, Browser: Non-SWAU, Non-CS student to test the information for aesthetics, functionality, and comprehension on internet browser of their choosing
* New User, Mobile: Non-SWAU, Non-CS student to test the information for aesthetics, functionality, and comprehension on mobile devices and tablets
* Returning User, Browser: SWAU students who are familiar with SWAU’s website. Will test for information transfer and information ease comparison on internet browser of their choosing
* Returning User, Mobile: SWAU students who are familiar with SWAU’s website. Will test for information transfer and information ease comparison on mobile devices and tablets

# Use Case

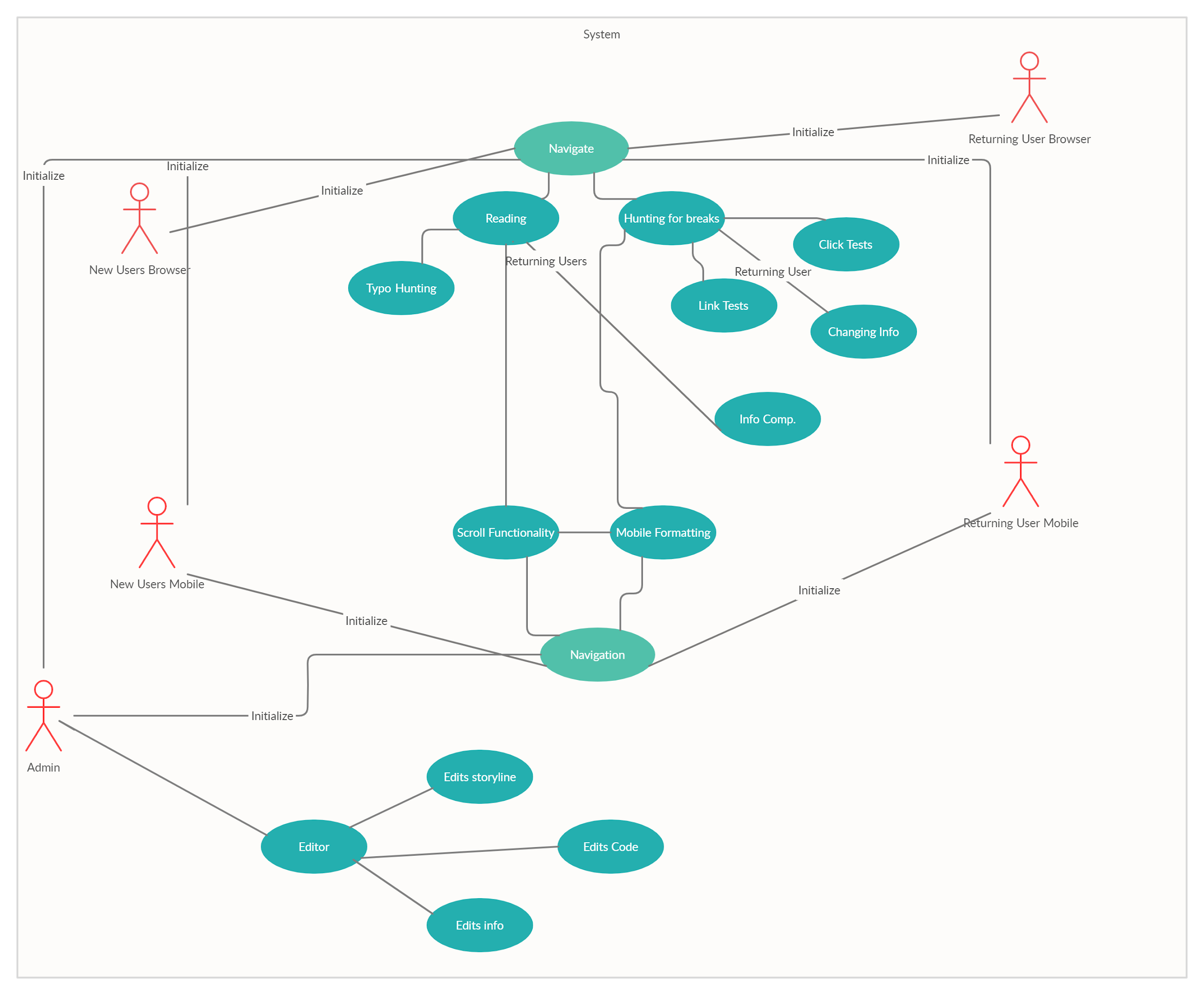
## Use Case Descriptions

* Admin (Me) [A]
  + Creates the system
  + Updates information
    - Requirements
      * Computer with Windows, MacOS, Linux [R1]
      * Internet Browser of their choice [R2]
      * I/O device (m + kb) [R3]
      * Internet connection [R4]
      * Ability to edit content [R5]
      * Ability to edit storyline [R6]
      * Ability to patch/repair broken bits [R7]
      * Literacy [R8]
      * Smartphone/Tablet with internet access [R9]
      * Previous knowledge of SWAU’s website [R10]
      * HTML knowledge [R11]
* New Users Browser [NUB]
  + New users will navigate the storyline, simply reading the information. They will be looking for typos, odd looking UI, broken links, etc.
  + They will be clicking everything they can to try to break the project
  + Link testing
  + Click testing
    - Requirements
      * Computer with Windows, MacOS, Linux [R1]
      * Internet Browser of their choice [R2]
      * I/O device (m + kb) [R3]
      * Internet connection [R4]
      * Literacy [R8]
* New Users, Mobile [NUM]
  + New users will navigate the storyline, simply reading the information. They will be looking for typos, odd looking UI, broken links, etc.
  + They will be clicking everything they can to try to break the project
  + Link testing
  + Click testing
    - Requirements
      * Smartphone/Tablet with internet access [R9]
      * Literacy [R8]
* Returning Users, Browser [RUB]
  + Returning users will be comparing the information on the storyline to the information they can gather from SWAU’s website and external sources.
  + Comparing the ease of navigation between SWAU’s website and storyline
  + Will try to change the information presented
    - Requirements
      * Computer with Windows, MacOS, Linux [R1]
      * Internet Browser of their choice [R2]
      * I/O device (m + kb) [R3]
      * Internet connection [R4]
      * Literacy [R8]
      * Previous knowledge of SWAU’s website [R10]
      * HTML knowledge [R11]
* Returning Users, Mobile [RUM]
  + Returning users will be comparing the information on the storyline to the information they can gather from SWAU’s website and external sources.
  + Comparing the ease of navigation between SWAU’s website and storyline
  + Will try to change the information presented
    - Requirements
      * Smartphone/Tablet with internet access [R9]
      * Internet connection [R4]
      * Literacy [R8]
      * Previous knowledge of SWAU’s website [R10]
      * HTML knowledge [R11]

## 

## Use Case Diagrams

### Overall Diagram

(Fig 1.1)

### 

### 

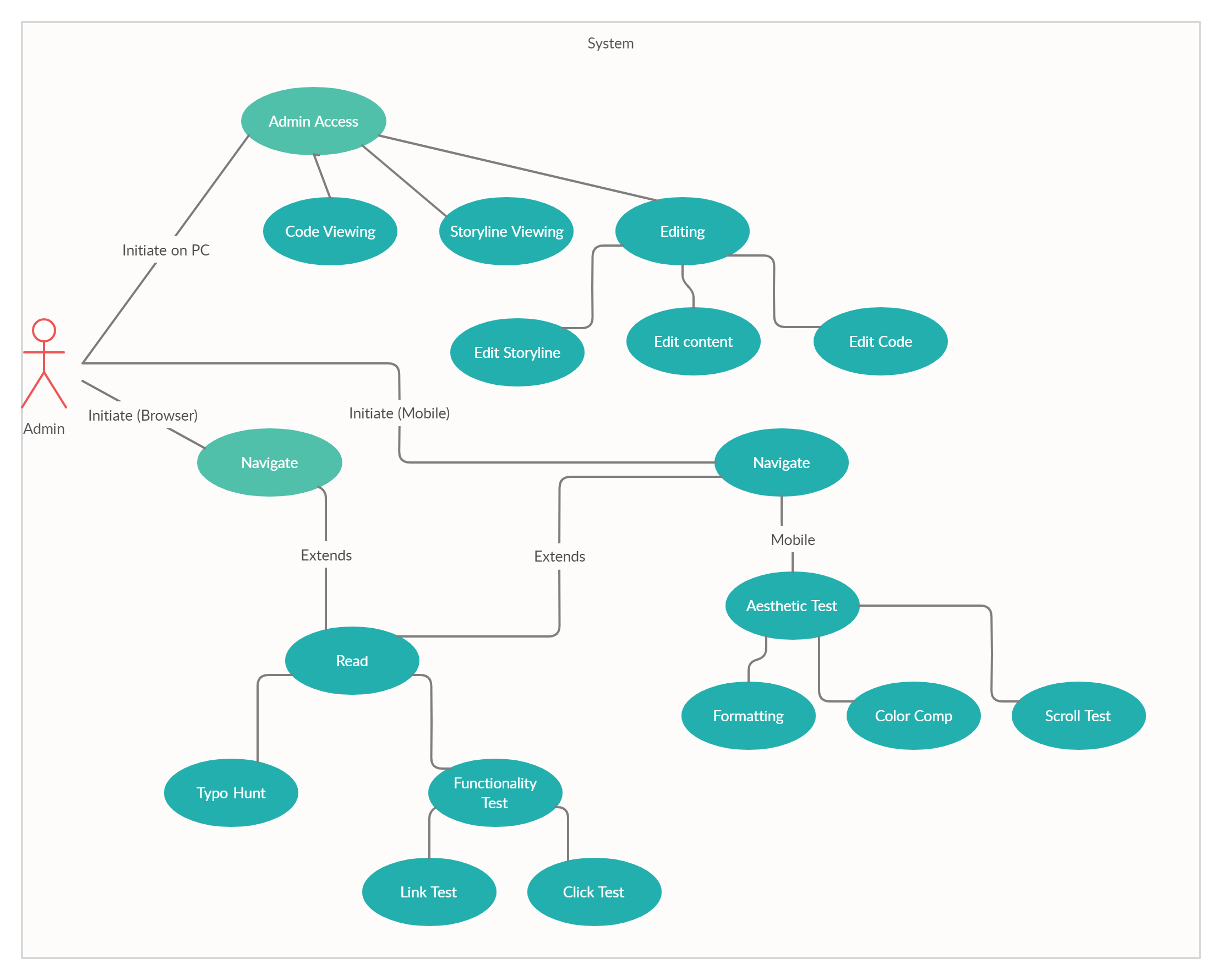
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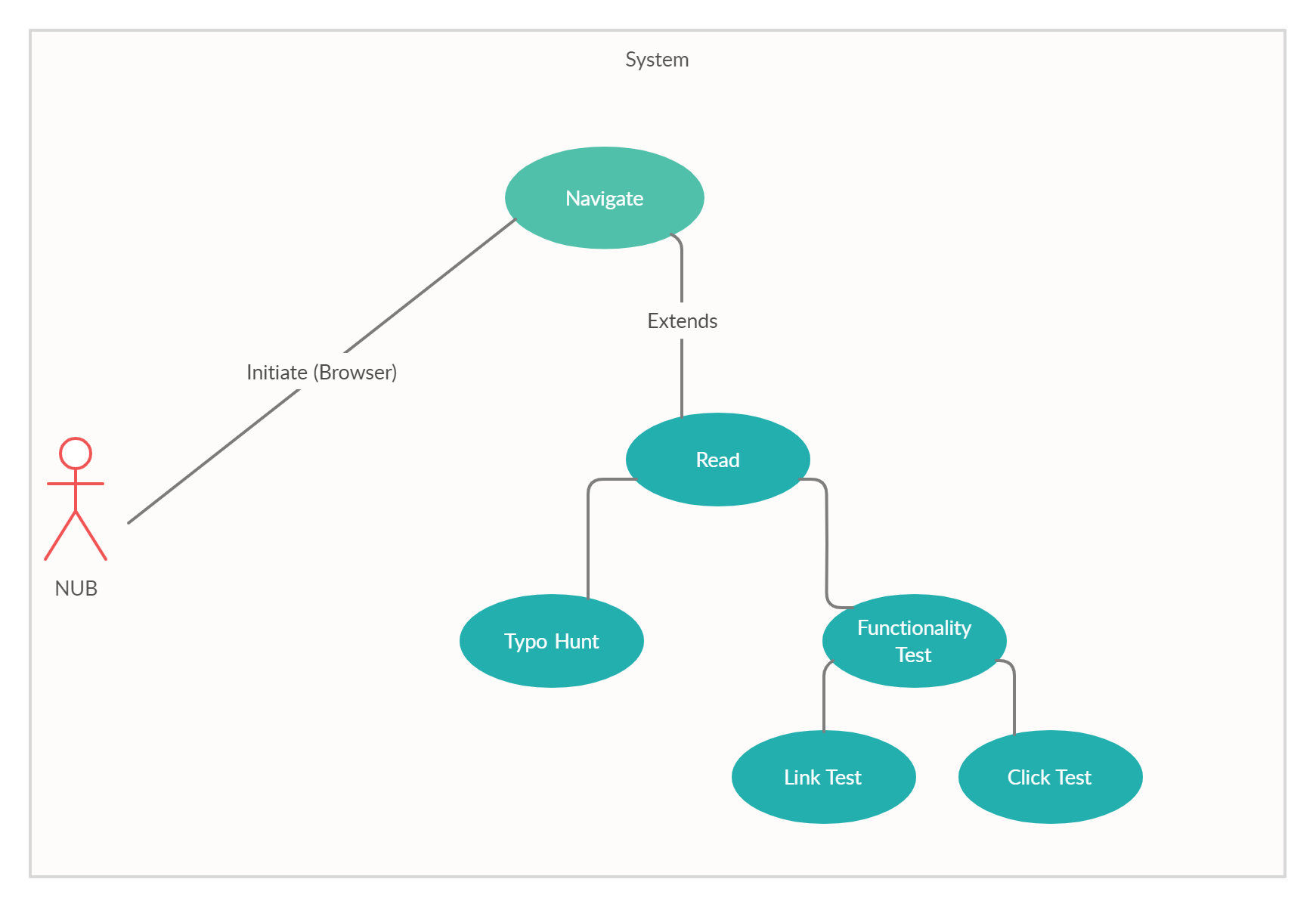
### 

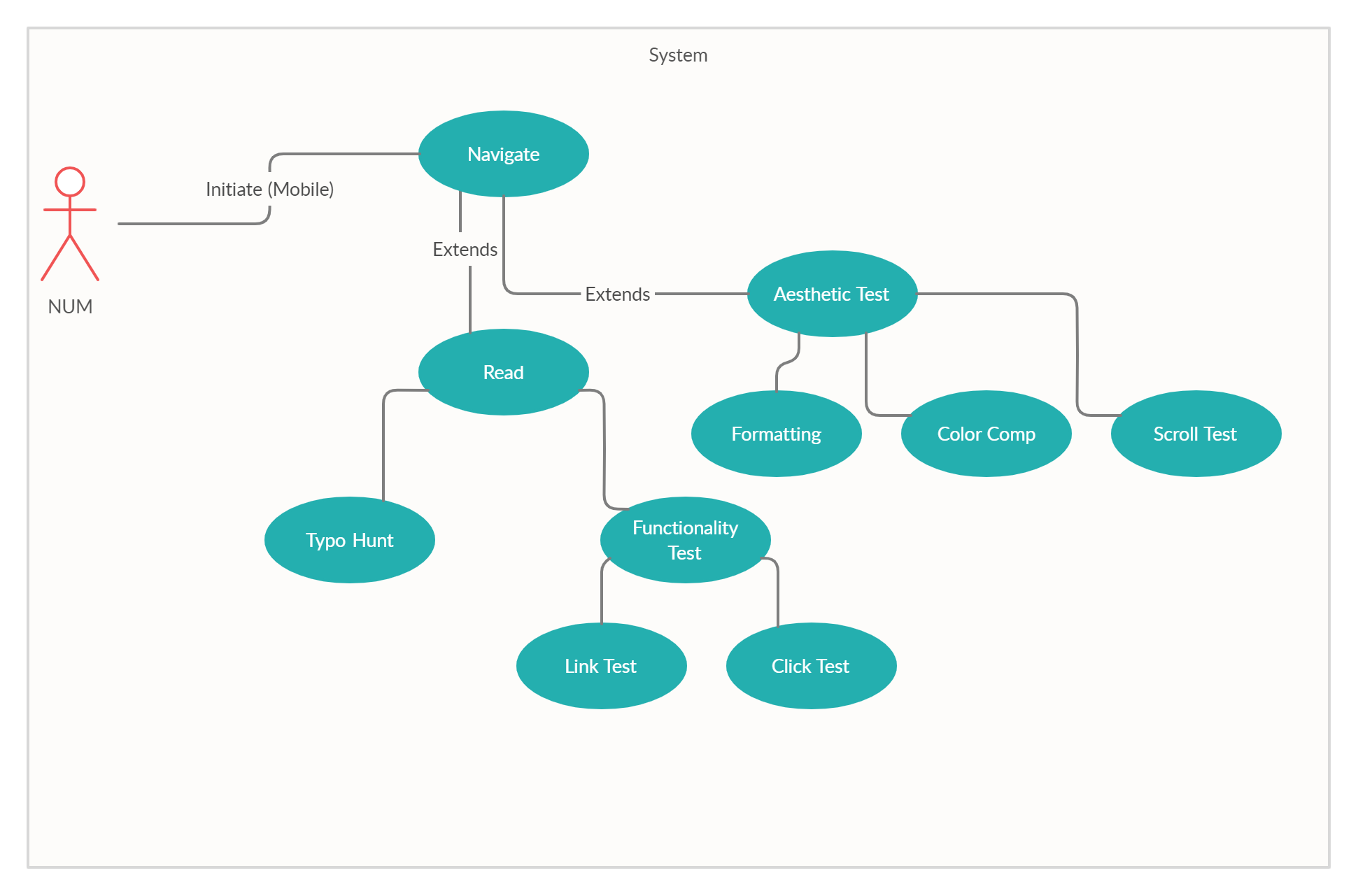
### 

### Admin Use Case Diagram

(Fig. 1.2)

### 

New Users, Browser [NUB] Use Case Diagram(Fig. 1.3)

New Users, Mobile [NUM] Use Case Diagram(Fig. 1.4)

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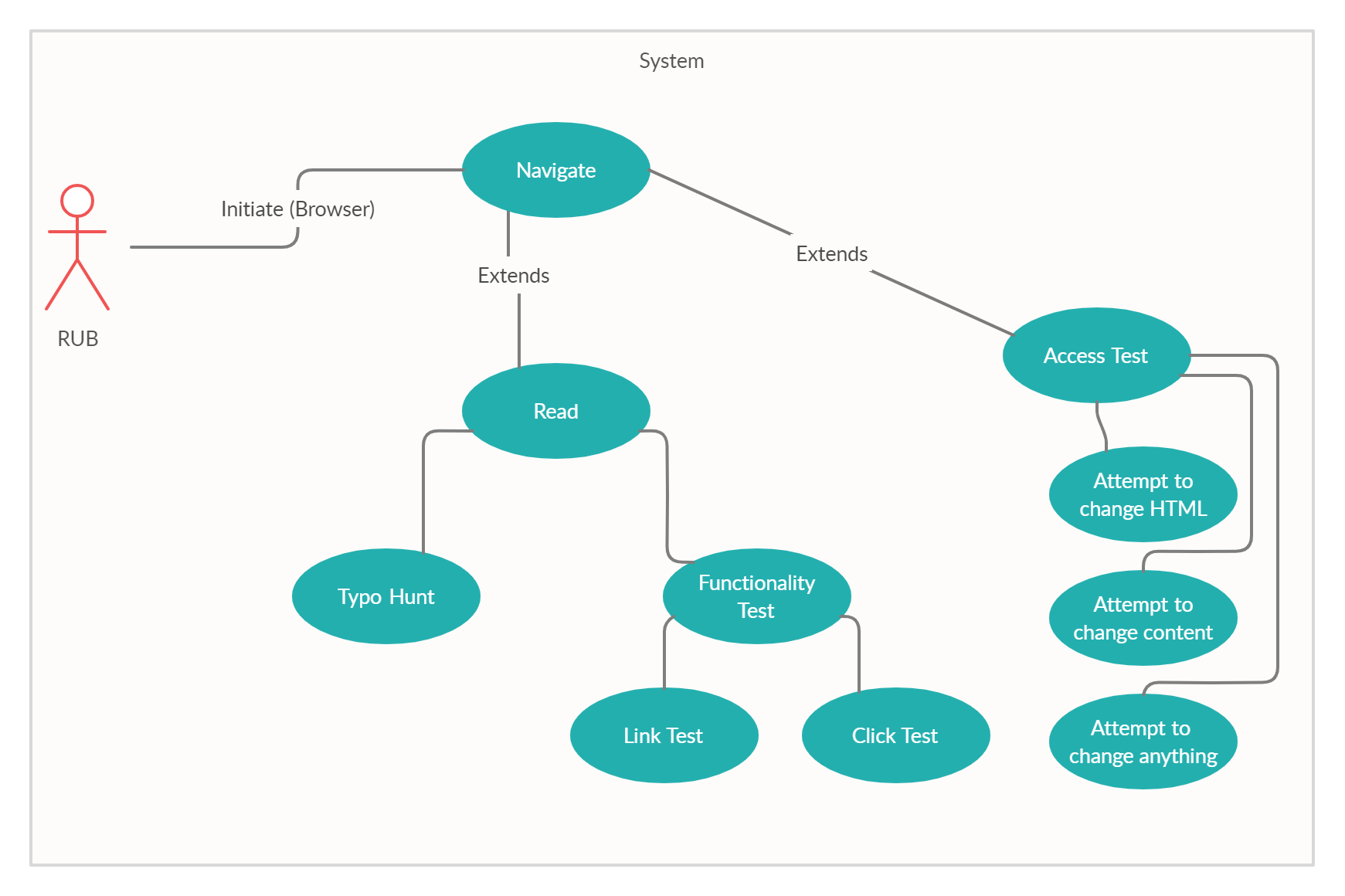
### 

### 

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### 

### Returning Users, Browser [RUB] Use Case Diagram

(Fig. 1.5)

### 

### Returning Users, Mobile [RUM] Use Case Diagram

(Fig. 1.6)

## 

## Traceability Matrix

## 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | NUB | NUM | RUB | RUM |
| R1 | x | x |  | x | x |
| R2 | x | x |  | x | x |
| R3 | x | x |  | x | x |
| R4 | x | x |  | x | x |
| R5 | x |  |  |  |  |
| R6 | x |  |  |  |  |
| R7 | x |  |  |  |  |
| R8 | x | x | x | x | x |
| R9 | x |  | x |  | x |
| R10 | x |  |  | x | x |
| R11 | x |  |  | x | x |

(Fig. 2.1)

# Interviewing Process

## Interviewer

Me, Chloe Solis

## Interviewees

I will be asking current Computer Science students as well as CS alumni for their thoughts and opinions on select courses from the Computer Science program.

## 

## 

## Topics

### CS Courses

I will be asking the interviewees for their thoughts and opinions on select courses from the Computer Science program. I will be asking for the positive experiences and thoughts that they have had in the classes.

### CS Professors

I will also be asking the interviewees for their thoughts and experiences with the Computer Science professors. They are free to include any positive aspects that they have, and if they cannot be positive, then I ask for them to at least be neutral.

### Special Note

Though this is an interview process, and I am asking for all my candidates to be honest, this will not be a course/teacher bashing session. Incoming students need to hear unbiased opinions, and not all student’s negative experiences are universal to others. Negative opinions are often influenced by personal bias. This is why I am asking for positives and neutral thoughts on courses and teachers in the Computer Science department.

# User Interface Design and Implementation

## User Interface

### Special Note

The following figures all show the hosting interface on Twine. This can be used and set up by the Admin of the storyline. Normal users would not have access to this via download, unless sharing for the purpose of everyone having access to the story web and content within.

This however, can be used by everyday users if simply set up in a browser. The admin would save or archive the .html file, and upload it on a twine instance in browser or on the downloadable software. They would then click Play, and the story would open in the default browser for users to have access to.

### Appearance

The user interface is designed using HTML. I have chosen to use SWAU themed colors which includes:

* Maroon/reddish background
* White rounded background that extends to the text’s bounds
* Charcoal grey text
* Black text with a red background (glow appearance) for linking to other passages and hyperlinks
* Dark grey text with blue background (glow appearance) for links that have been used
* Sidebar is semi opaque
* Sidebar includes a semi opaque return arrow
* Browser Only: Mousing over a link will change the color to cyan, mousing over a used link will change the color to magenta

### 

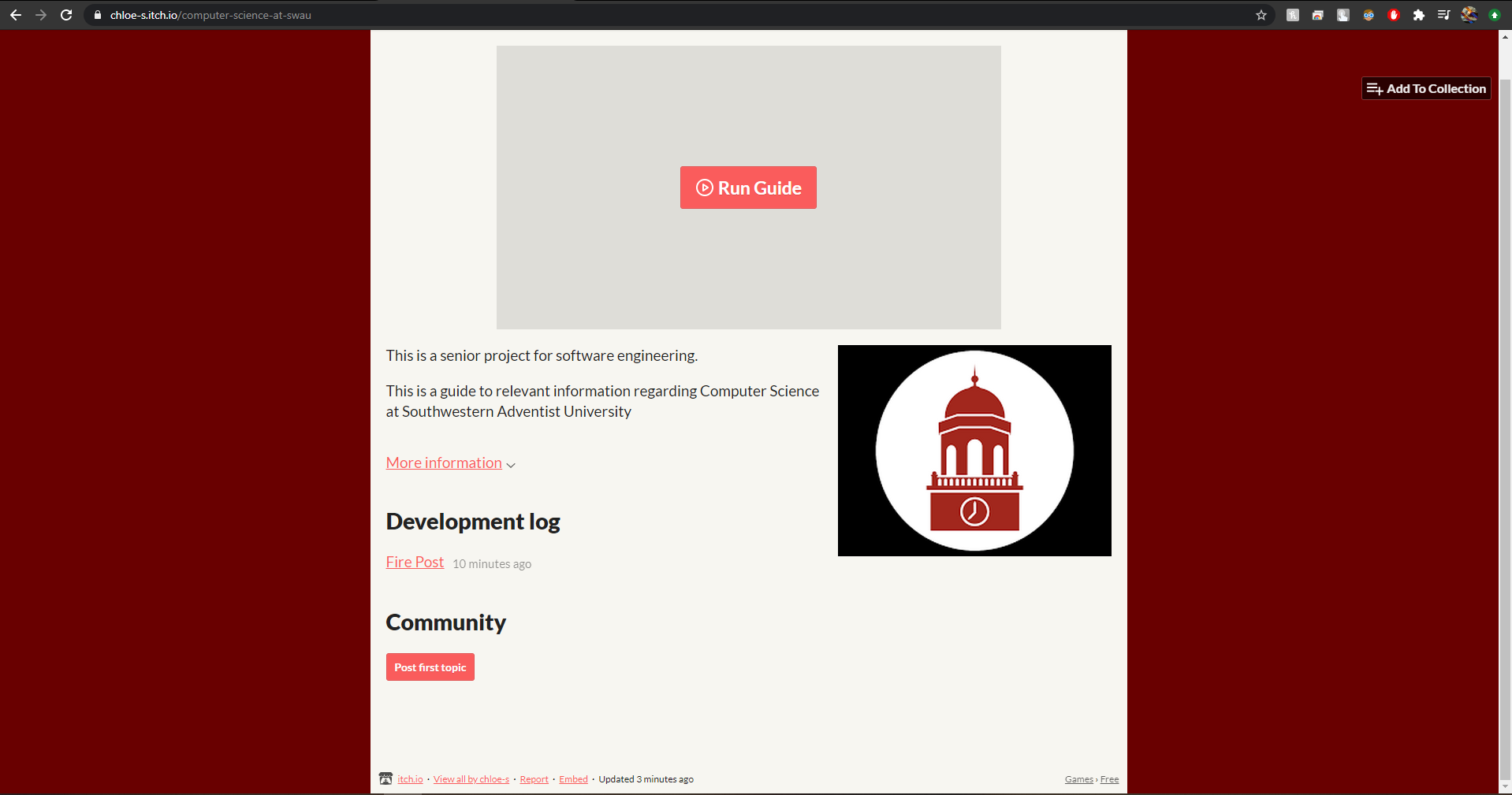
### 

### 

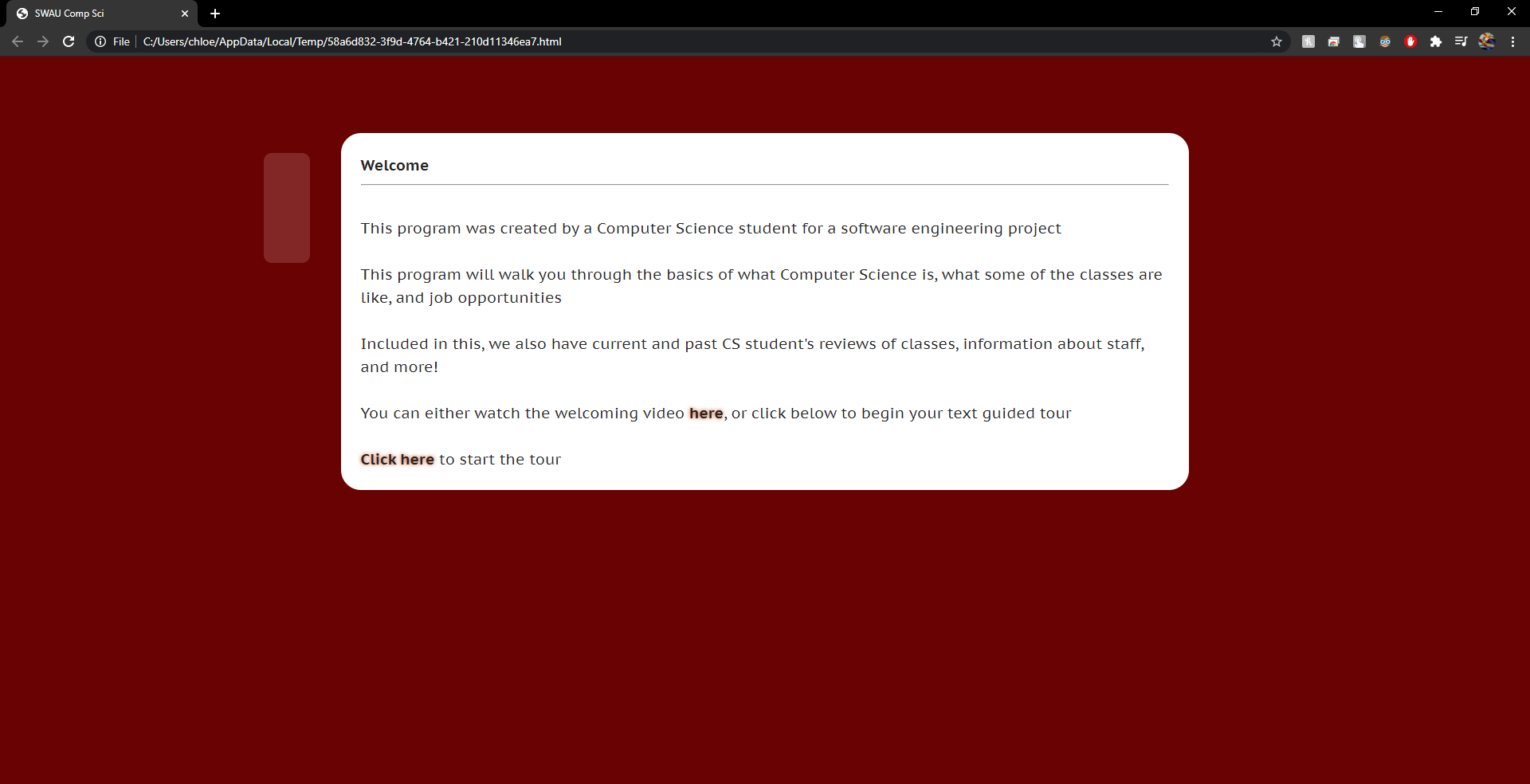
### 

### Overall

This text based guide is available to use on both itch.io in web browser (Fig.3.0, 3.1) and mobile (3.2). You can see images of the two down below.



(Fig. 3.0

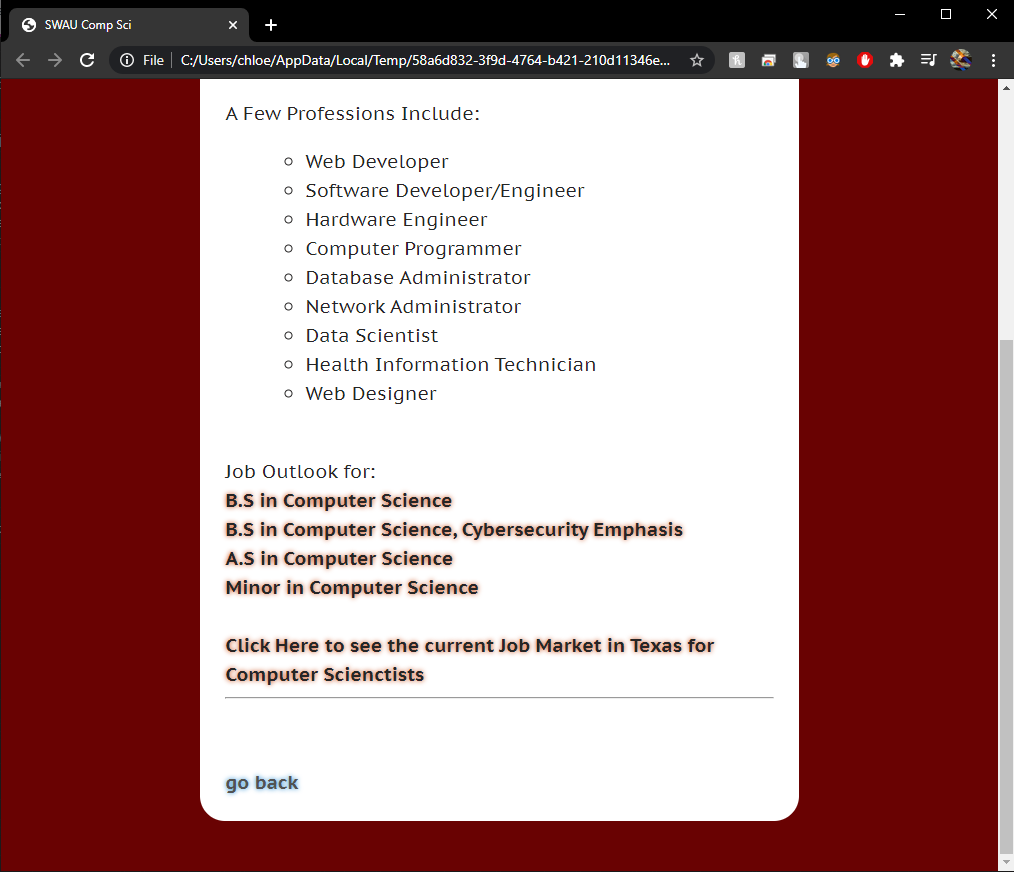


(Fig. 3.1)

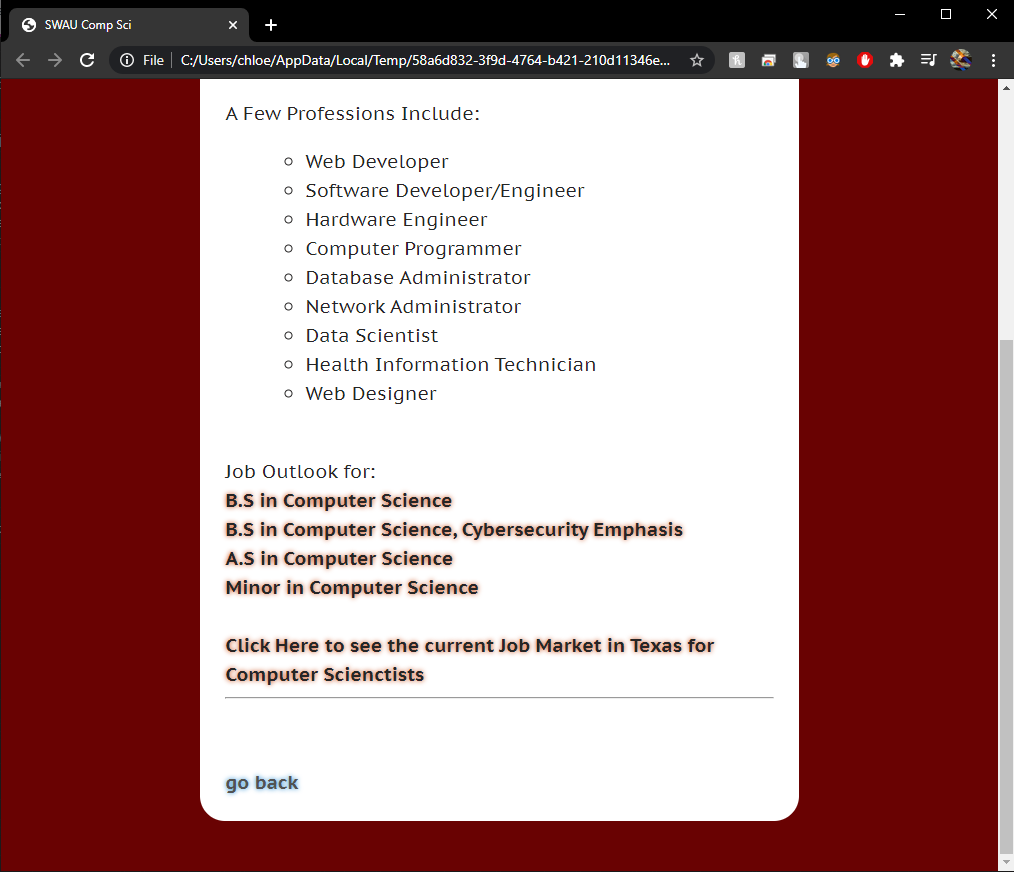
#### Links

The guide continues in a linear fashion with a web style mapping. The story map is not visible to users. Each passage is connected to another by the usage of “links” in the story. The links are bolded and highlighted with a glow effect as listed in Appearance, with the links changing color appearance depending on if the link has been visited before. You can see an example of this in Fig. 3.3 and Fig. 3.4

While there are five links with a red glow (meaning they have not been visited) (Fig. 3.3), the “go back” link has a blue glow (meaning it has been visited) (Fig. 3.4). Since users do not have access to the story map, this feature will help users to know if they have visited the previous page.



(Fig. 3.3)

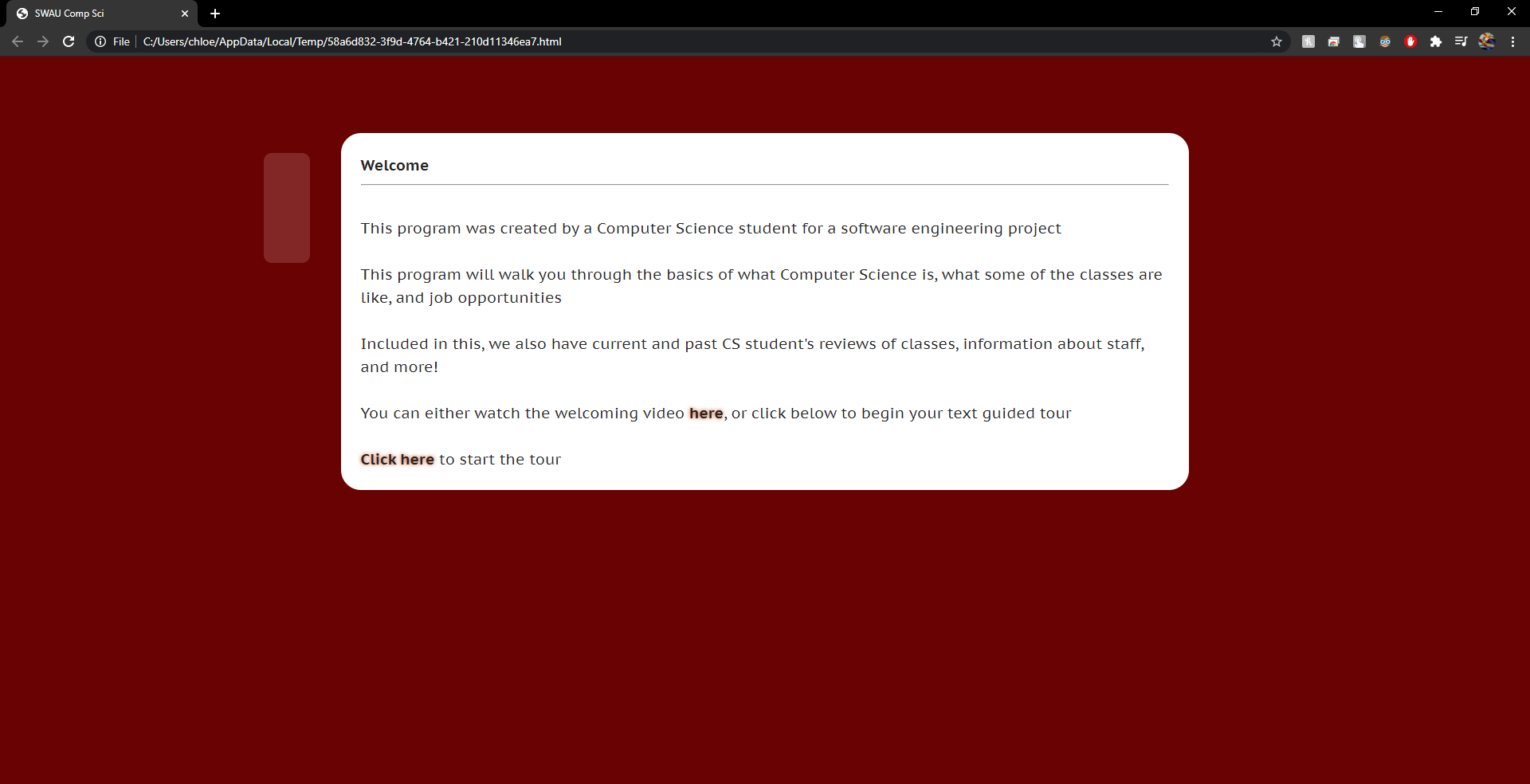


(Fig. 3.4)

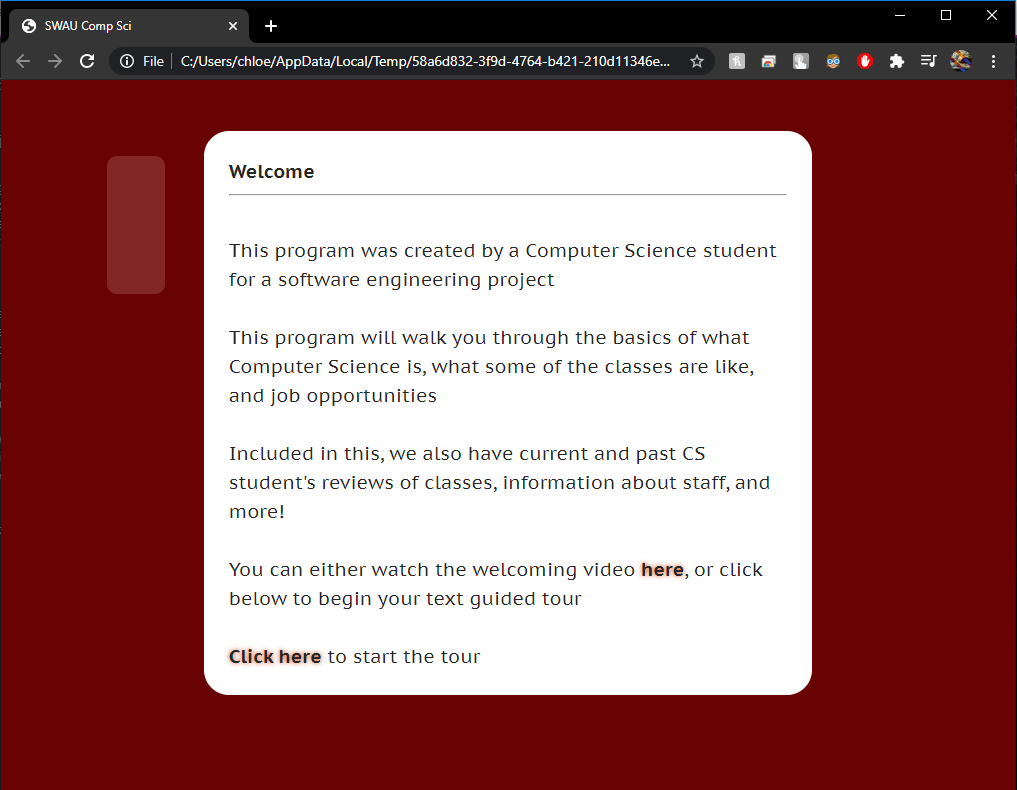
### Browser Usage

As this is a Twine 2.0 Harlowe 2.1.0 formatted text “storyline” guide, the user is presented with a screen that includes the HTML formatting of the creator’s choice. I have listed the appearance above.

The formatting I have used auto adjusts based on the size of the browser window (as seen in Fig. 3.5 and 3.6 below)

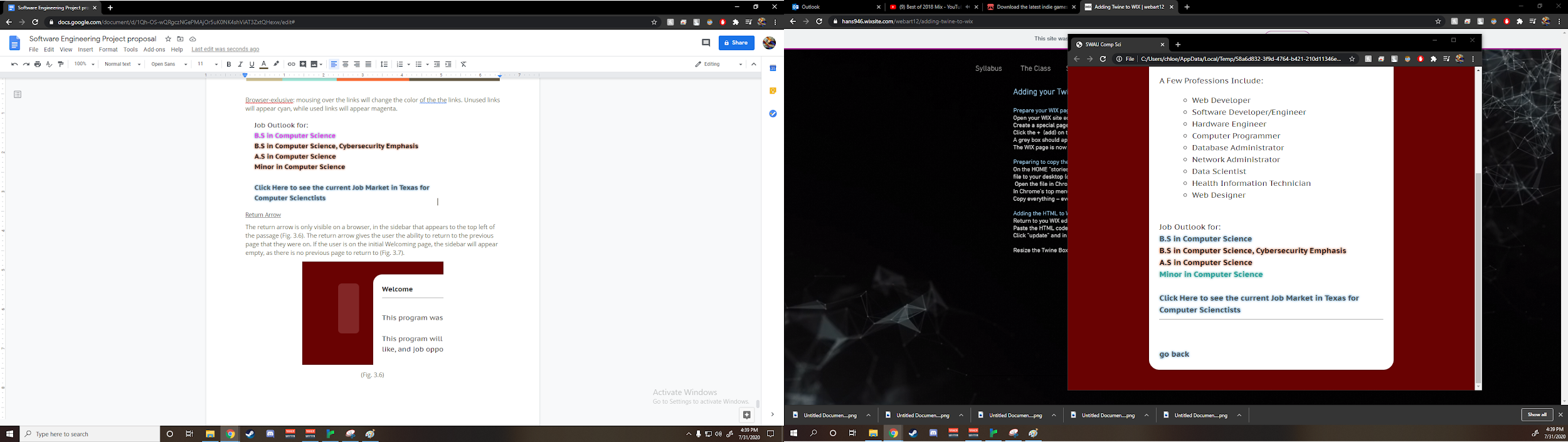


(Fig. 3.5)

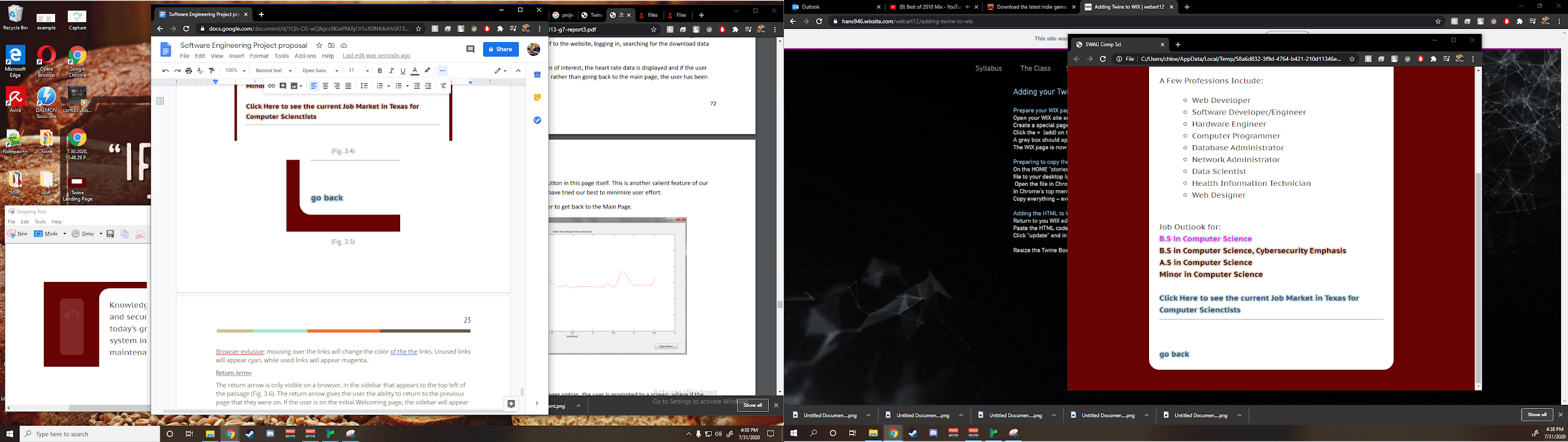


(Fig. 3.6)

Mousing over the links will change the color of the the links. Unused links will appear cyan (Fig. 3.7), while used links will appear magenta (Fig.3.8).



(Fig. 3.7)



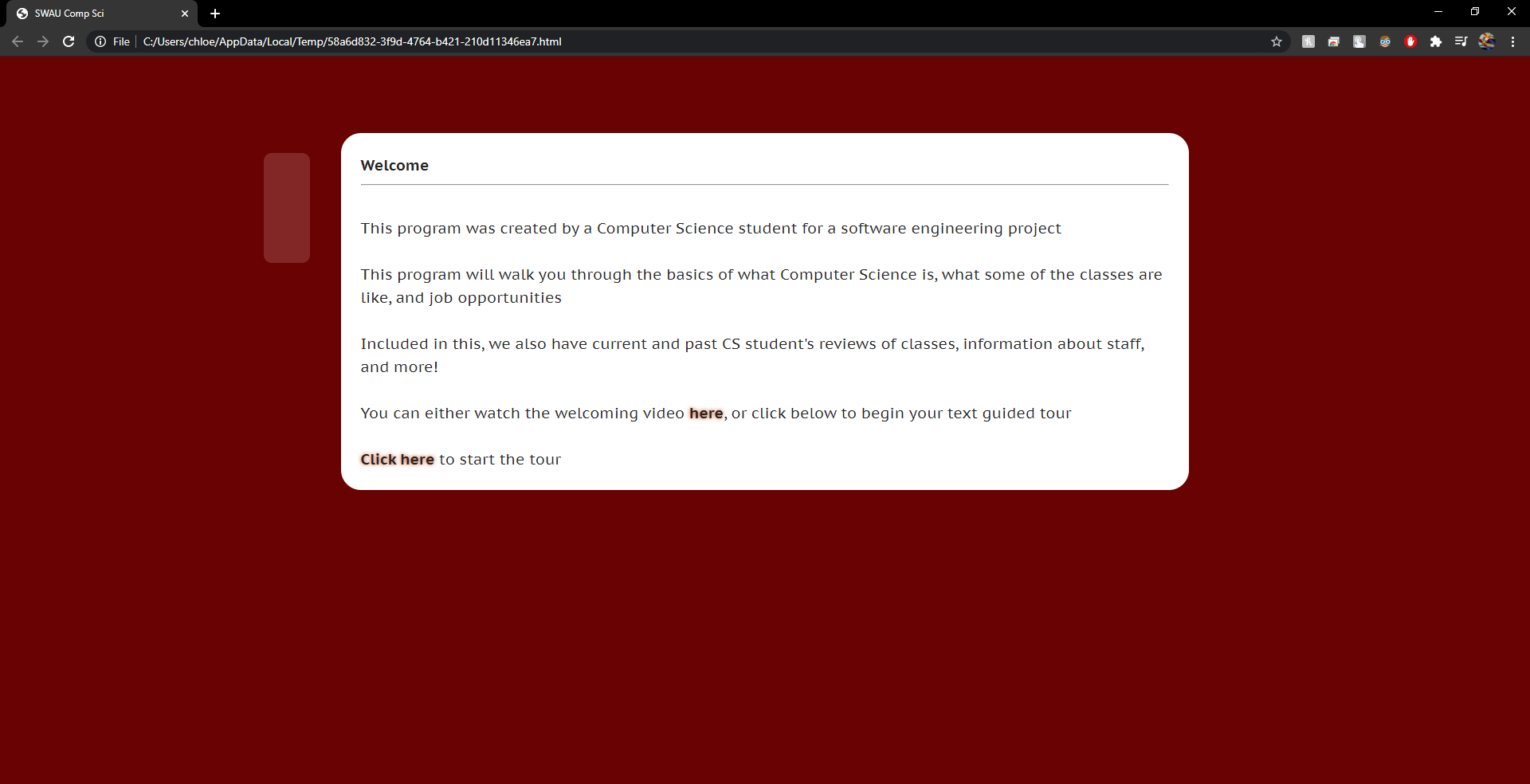
(Fig. 3.8)

#### Sidebar Arrows

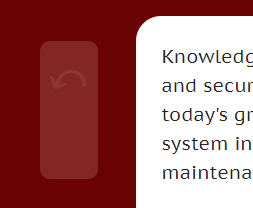
The return and forward arrows are only visible on a browser, in the sidebar that appears to the top left of the passage (Fig. 3.9).

The return arrow gives the user the ability to return to the previous page that they were on. If the user is on the initial Welcoming page, the sidebar will appear empty, as there is no previous page to return to (Fig. 3.10).

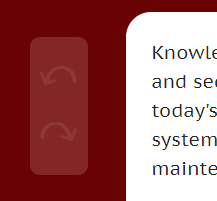
The forward arrows (3.11) will appear in the sidebar if a user clicks to the previous passage, and the most recent visited page is still available to go to. Think of it as backwards and forwards buttons that are on browsers.



(Fig. 3.9)



(Fig. 3.10)



(Fig. 3.11)

### 

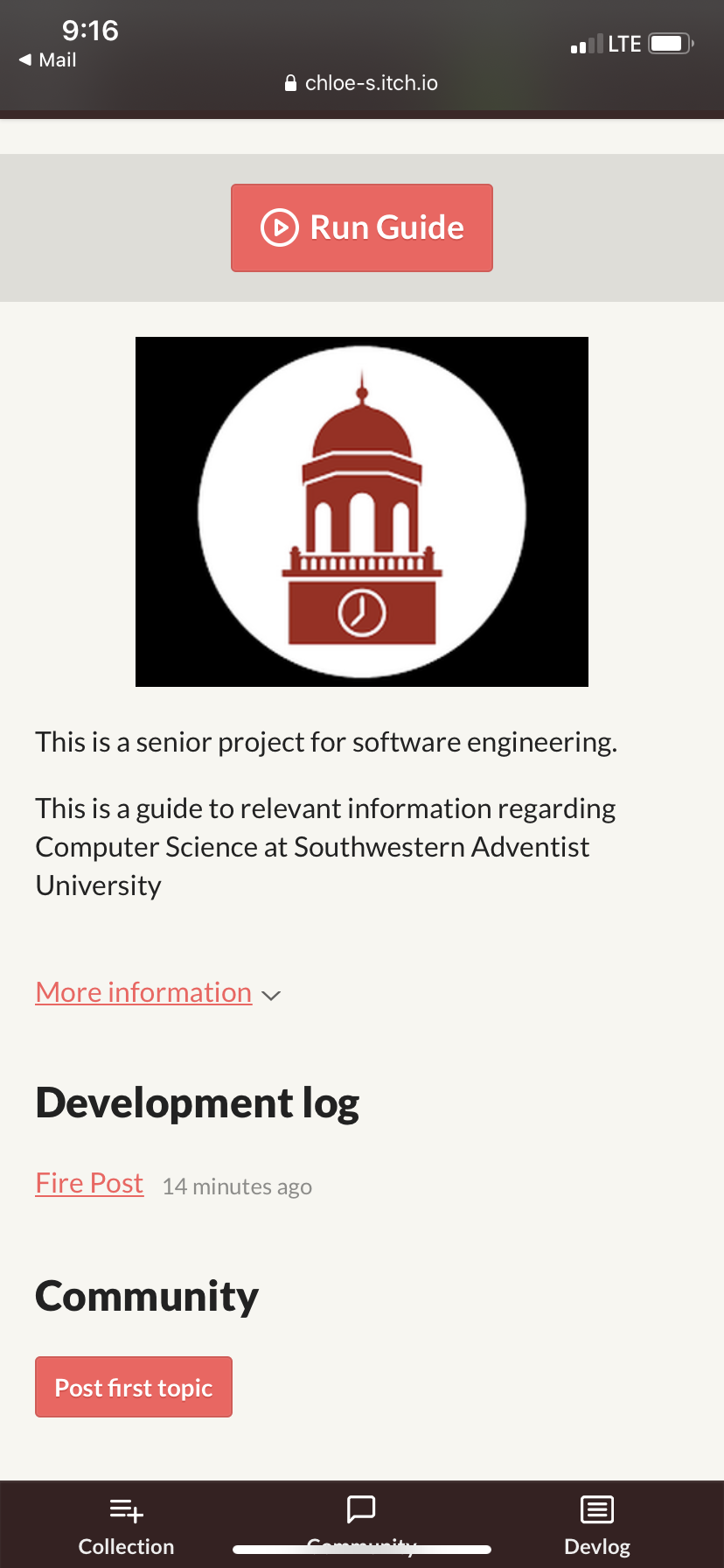
### 

### 

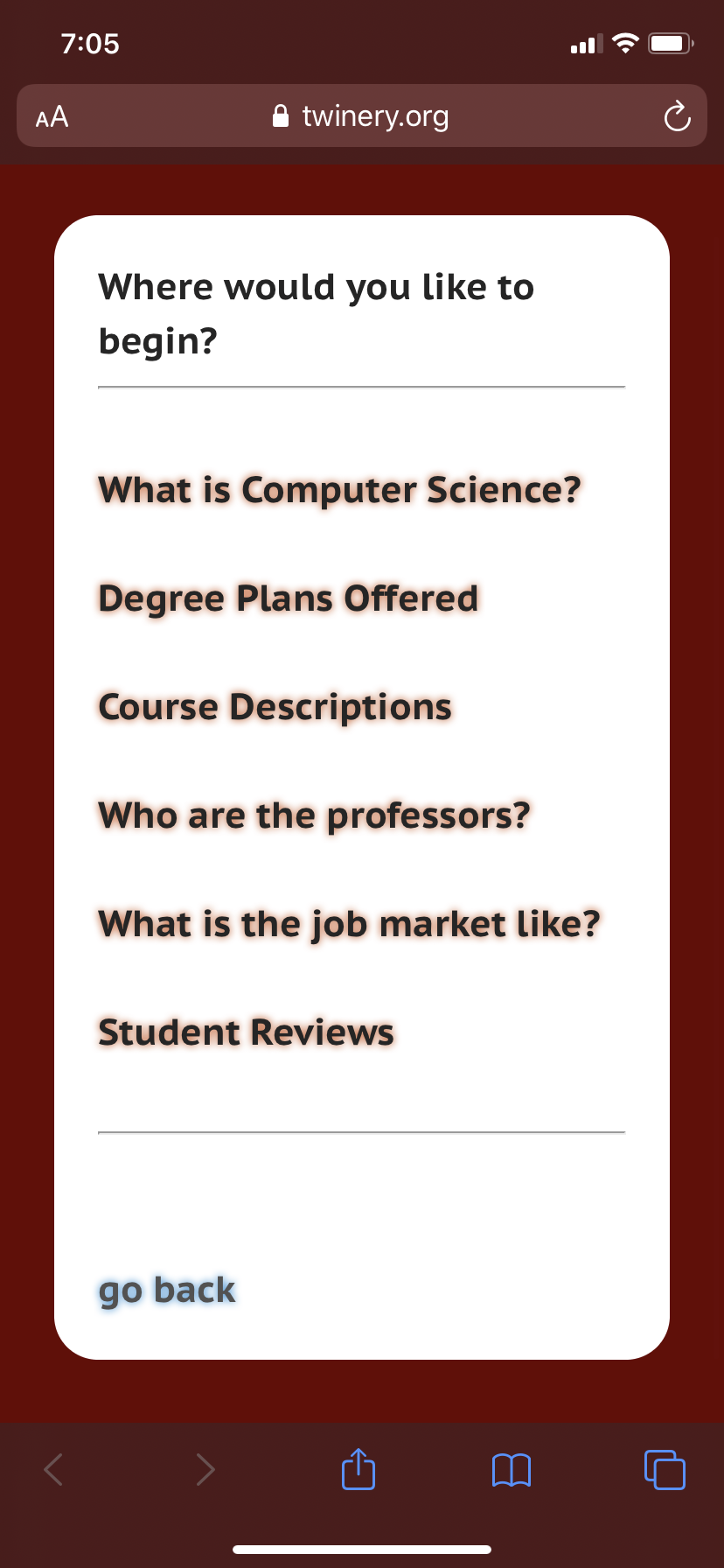
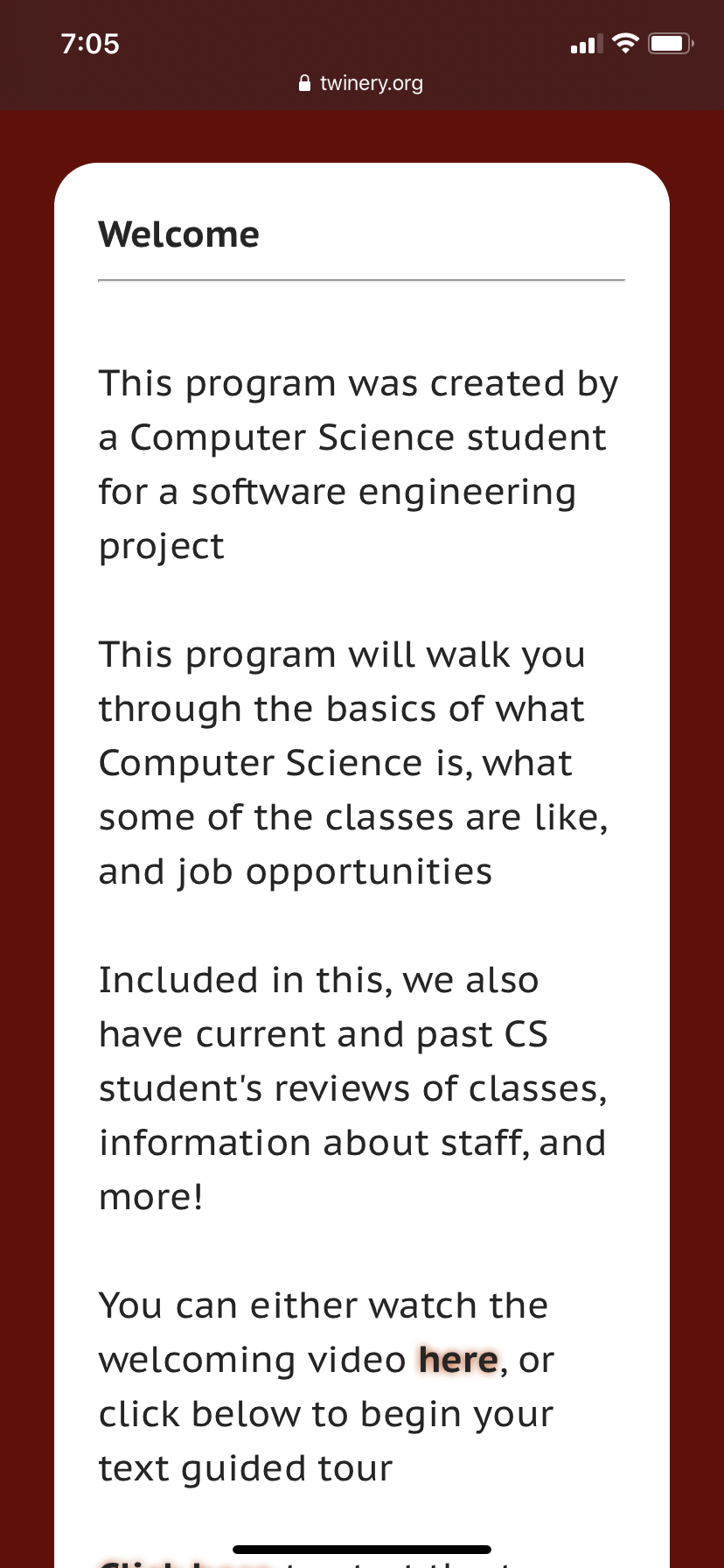
### 

### Mobile Usage

This text guided tour is also available on mobile. Users can gain access to it by having a link shared with them via email, text, etc., or by finding the game on itch.io. Once the link is clicked, they are taken directly to the itch.io landing page for my account. (Fig. 4.1) Clicking Run Guide will take you to the beginning of the guide, at the Welcoming page of the guide (Fig. 4.3).



This guide is mobile friendly, and will adjust to the screen size of the device (Fig. 4.2, 4.3)

(Fig. 4.2) (Fig .4.3)

# Story Web

## Twine Overview

The Twine story web can be created via click and drag to add passages and links, or it can be created and edited via code.

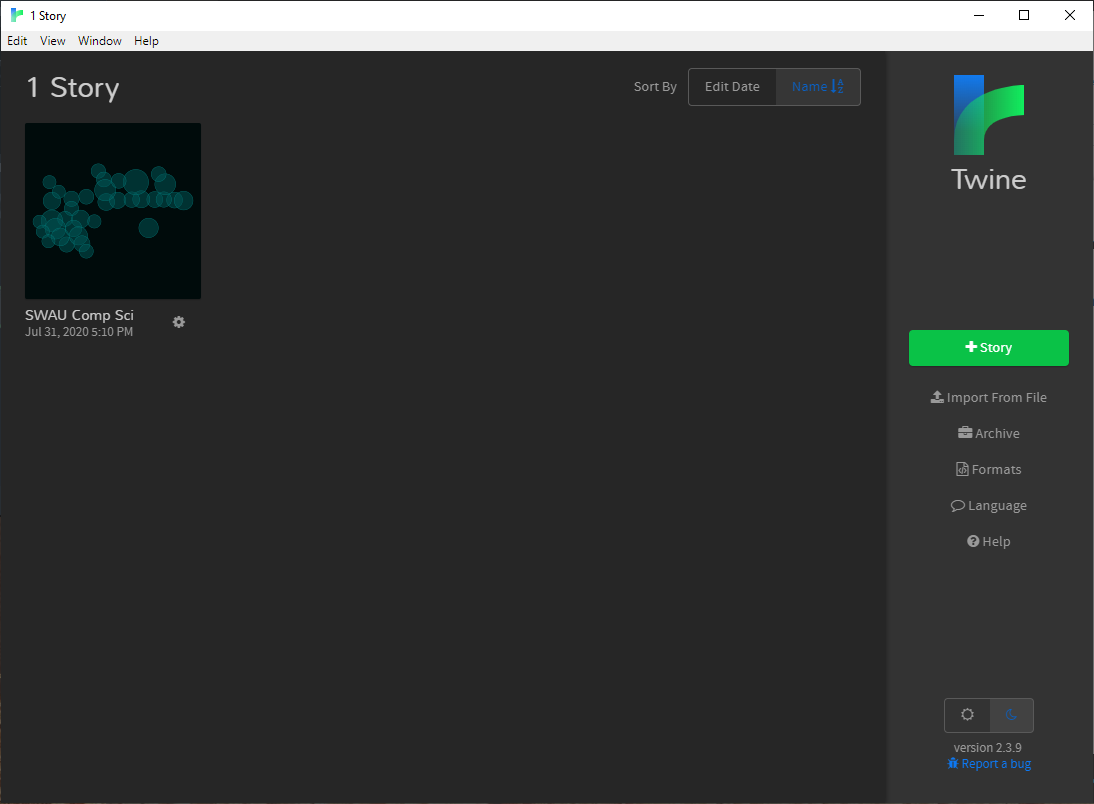
Using the twine interface allows for editing with click and drag, javascript, and css all in one space. It supports the use of HTML within the passages, along with its own styling.

The Twine downloadable software allows for creating your own instance of twine without using the browser.

The Twine 2.0 Harlowe 2.1.0 official documentation can be found here: <https://twinery.org/wiki/harlowe:reference>

As well as an unofficial documentation here: <https://twine2.neocities.org/2.html> The unofficial documentation contains all of the information as the official documentation, but it is formatted into one long webpage instead of menu’d items.

#### Home Screen



(Fig. 5.1)

## 

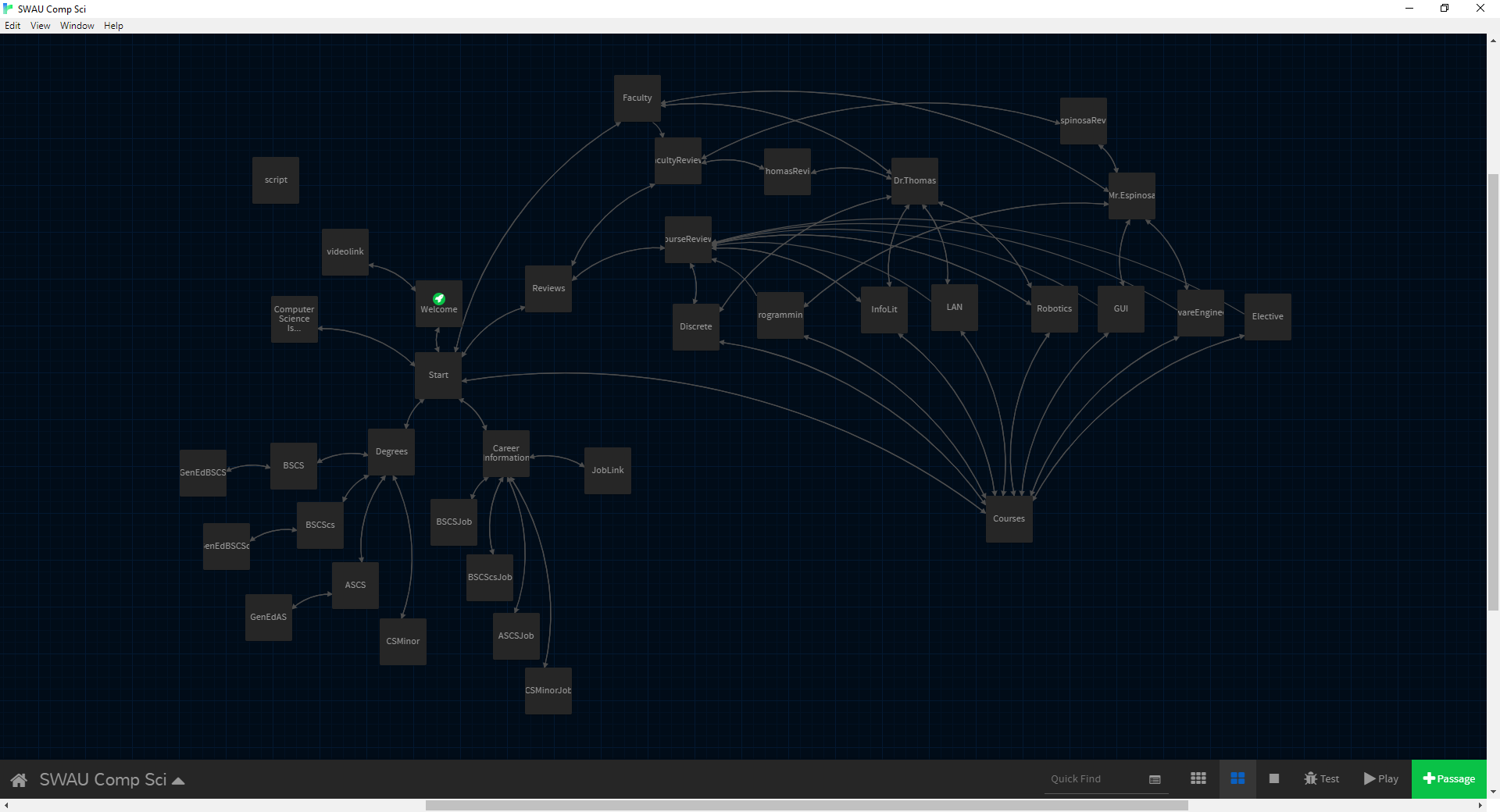
## 

## 

## 

## 

## Story Map



(Fig. 5.2)

The story map in Fig. 5.2 shows the whole of the information stored within the twine storyline, along with the paths and directions they can travel to and from, and what they are connected to.

**Key:**

**[[ ]] -** Items that have double box brackets on either end signify links to other passages.

**-> -** The arrow acts as the link creator between two passages in the story. The text on the left is the text that users would see, while the text to the right of the arrow is what the passage block is named (this is not visible to users)

Listed below are the mappings in text form. Please keep in mind all passages contain information relevant to their titles, and this is ONLY a simple mapping guide. The information contained is not included in this list.

* Welcome Page
  + External Link to SWAU created Computer Science video
  + Link to Start menu
* Start Menu
  + [[What is Computer Science?->Computer Science Is...]]
    - What is Computer Science
  + [[Degree Plans Offered->Degrees]]
    - [[B.S in Computer Science->BSCS]]
      * [[General Education->GenEdBSCS]]
        + Includes external link to SWAU Gen Ed requirements for a B.S in science
        + [[go back->BSCS]]
      * [[go back->Degrees]]
    - [[B.S in Computer Science, Cybersecurity Emphasis->BSCScs]]
      * [[General Education->GenEdBSCScs]]
        + Includes external link to SWAU Gen Ed requirements for a B.S in science
        + [[go back->BSCScs]]
      * [[go back->Degrees]]
    - [[A.S in Computer Science->ASCS]]
      * [[General Education->GenEdAS]]
        + Includes external link to SWAU Gen Ed requirements for a A.S in science
        + [[go back->ASCS]]
      * [[go back->Degrees]]
    - [[Minor in Computer Science->CSMinor]]
      * [[go back->Degrees]]
    - [[go back->Start]]
  + [[Course Descriptions->Courses]]
    - [[CSIS 125 & 225: Discrete Structures I & II->Discrete]]
      * [[Dr.Thomas]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]]
    - [[CSIS 110 & 111: Principles of Computer Programming I & II->Programming]]
      * [[Mr.Espinosa]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]]
    - [[CSIS 201: Information Literacy for CS Majors->InfoLit]]
      * [[Dr.Thomas]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]
    - [[CSIS 245: Introduction to Local Area Network Technology->LAN]]
      * [[Dr.Thomas]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]
    - [[CSIS 315: Application Development for Event-Driven GUI Applications->GUI]]
      * [[Mr.Espinosa]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]]
    - [[CSIS 375: Introduction to Robotics Systems->Robotics]]
      * [[Dr.Thomas]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]
    - [[CSIS 490: Software Engineering->SoftwareEngineering]]
      * [[Mr.Espinosa]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]]
    - [[CSIS Upper Devision Elective->Elective]]
      * [[Courses]]
      * [[Course Reviews->CourseReviews]]
    - [[go back->Start]]
  + [[Who are the professors?->Faculty]]
    - [[Dr. Thomas->Dr.Thomas]]
      * [[''Student Reviews''->Dr.ThomasReviews]]
        + [[Dr.Thomas]]
        + [[back to->FacultyReviews]]
      * [[Discrete]]
        + [[Dr.Thomas]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]
      * [[InfoLit]]
        + [[Dr.Thomas]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]
      * [[LAN]]
        + [[Dr.Thomas]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]
      * [[Robotics]]
        + [[Dr.Thomas]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]
      * [[back to Faculty->Faculty]]
    - [[Mr. Espinosa->Mr.Espinosa]]
      * [[''Student Reviews''->Mr.EspinosaReviews]]
      * [[GUI]]
        + [[Mr.Espinosa]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]]
      * [[SoftwareEngineering]]
        + [[Mr.Espinosa]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]]
      * [[Programming]]
        + [[Mr.Espinosa]]
        + [[Courses]]
        + [[Course Reviews->CourseReviews]]
      * [[back to Faculty->Faculty]]
    - [[Student's Reviews on Professors->FacultyReviews]]
      * Student reviews of [[Dr. Thomas->Dr.ThomasReviews]]
      * Student reviews of [[Mr. Espinosa->Mr.EspinosaReviews]]
      * [[go back->Reviews]]
    - [[go back->Start]]
  + [[What is the job market like?->Career Information]]
    - [[B.S in Computer Science->BSCSJob]]
      * [[go back->Career Information]]
    - [[B.S in Computer Science, Cybersecurity Emphasis->BSCScsJob]]
      * [[go back->Career Information]]
    - [[A.S in Computer Science->ASCSJob]]
      * [[go back->Career Information]]
    - [[Minor in Computer Science->CSMinorJob]]
      * [[go back->Career Information]]
    - External Link to Indeed
      * [[go back->Career Information]]
    - [[go back->Start]]
  + [[Student Reviews->Reviews]]
    - [[Faculty Reviews->FacultyReviews]]
      * Student reviews of [[Dr. Thomas->Dr.ThomasReviews]]
      * Student reviews of [[Mr. Espinosa->Mr.EspinosaReviews]]
      * [[go back->Reviews]]
    - [[Course Reviews->CourseReviews]]
      * [[Discrete]]
      * [[Information Literacy for CS Majors->InfoLit]]
      * [[Robotics]]
      * [[go back->Reviews]]
    - [[go back->Start]]
  + [[go back->Welcome]]

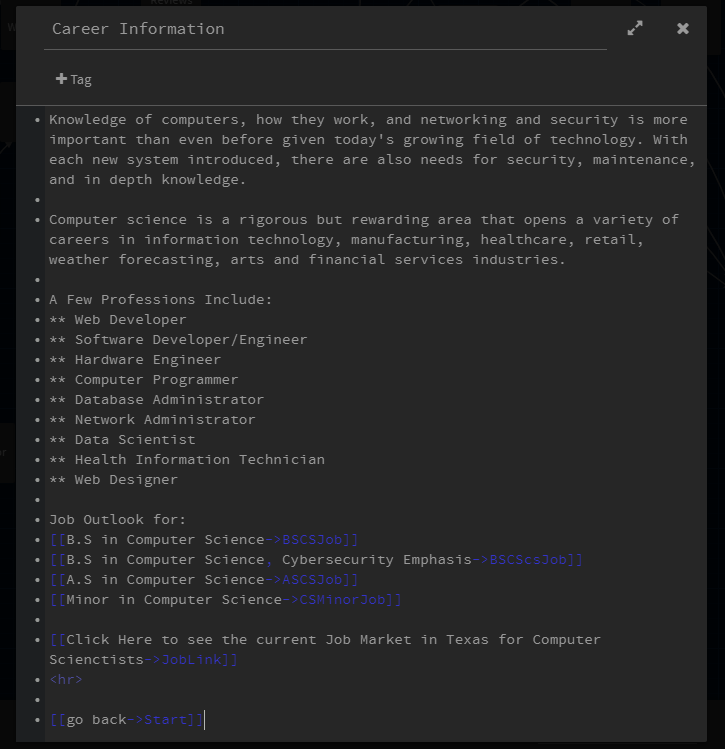
Please note that this story map does NOT include all links, as there would be a lot of repetition and would become more confusing than it already is in this form.

Each passage has the ability to go back to the previous, and depending on the information within, jump to other passages and topics.

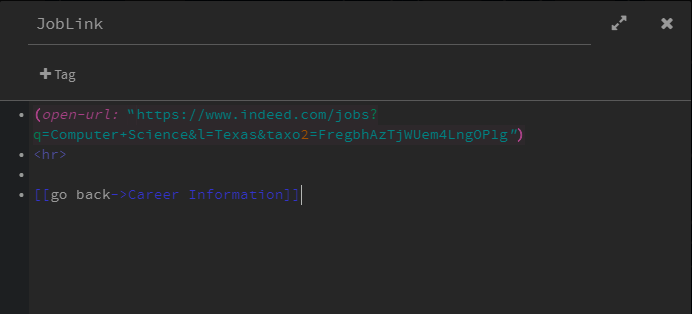
## 

## Editing the StoryWeb

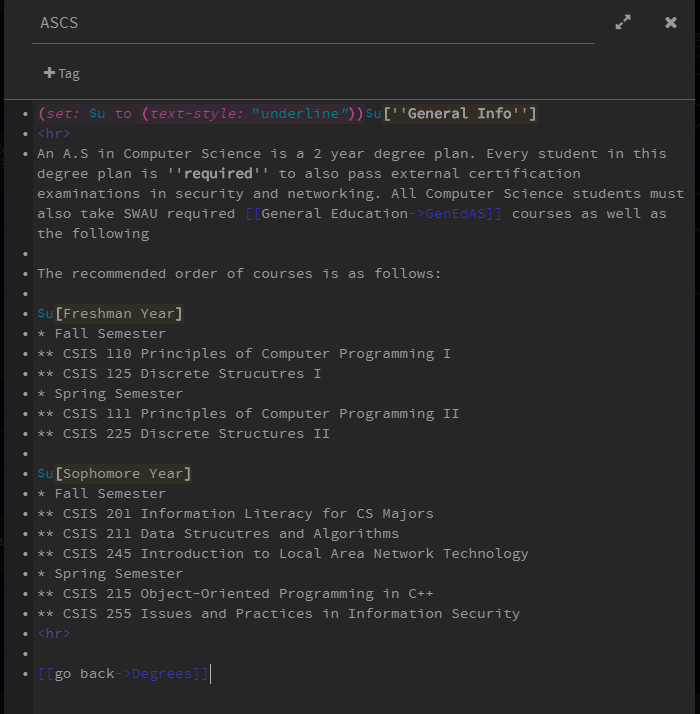
During the creation process, to edit the web I used the click and drag options on the twine interface as well as editing within the HTML code to get the results that I desired.

Featured in the figures below is what editing the information looks like within the Twine interface. You can see the links between the passages as -> arrows, [[ ]] passages, as well as passage titles vs titles that the users see (e.g [[B.S in Computer Science->BSCSJob]], B.S in Computer Science is what the user sees during the guide, and BSCSJob is what the creator sees.)

(Fig. 6.1) The basics of creation of information as well as passage links forwards and backwards



(Fig. 6.2) This opens a new browser tab to the link given in the figure, as well as a go back option



(Fig. 6.3) Includes stylization of the text within the passage itself using the creation of variables

### 

### Editing the HTML

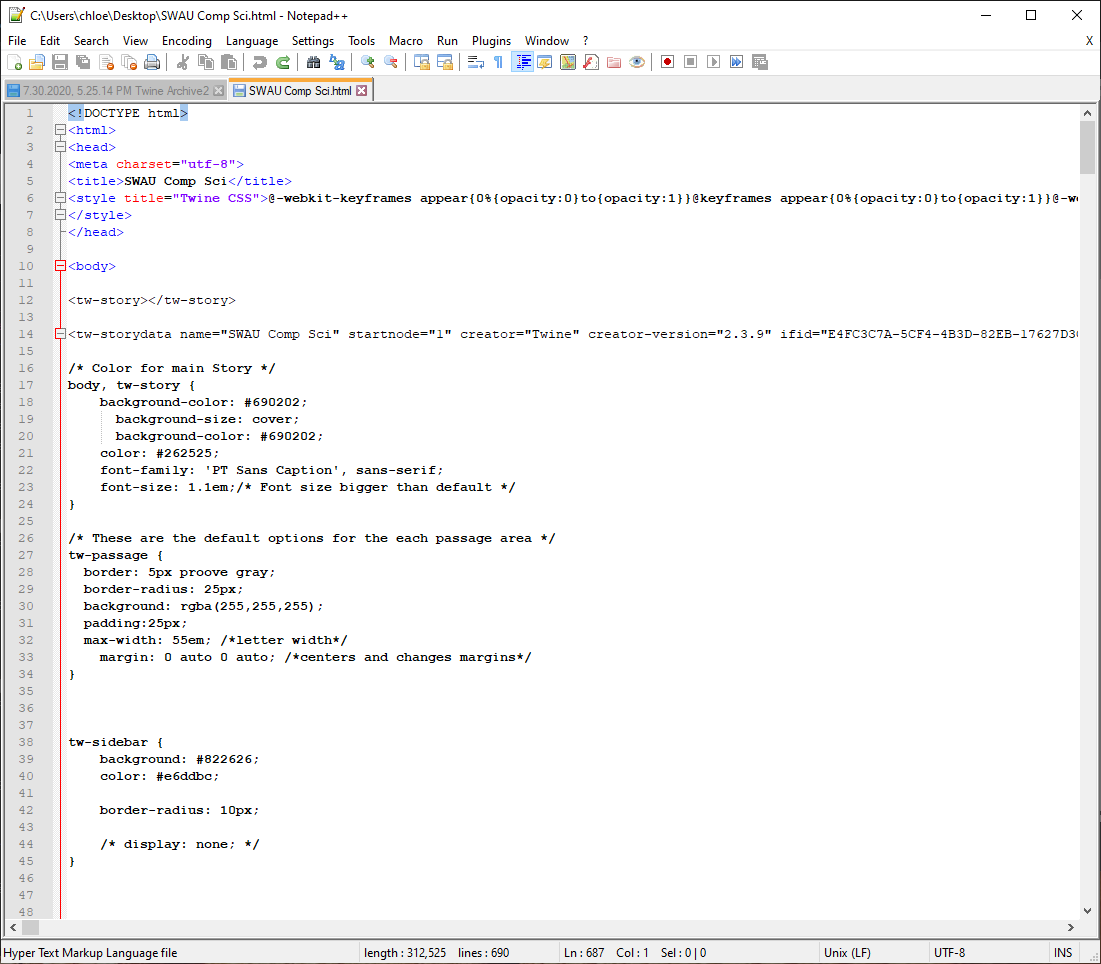
The code for a twine story is compiled in one long document, filled to the brim with HTML code.

Applying global variables and CSS is possible, as well as assigning each individual passage its own formatting and appearance as well. I have decided to keep it uniform for professionality’s sake.

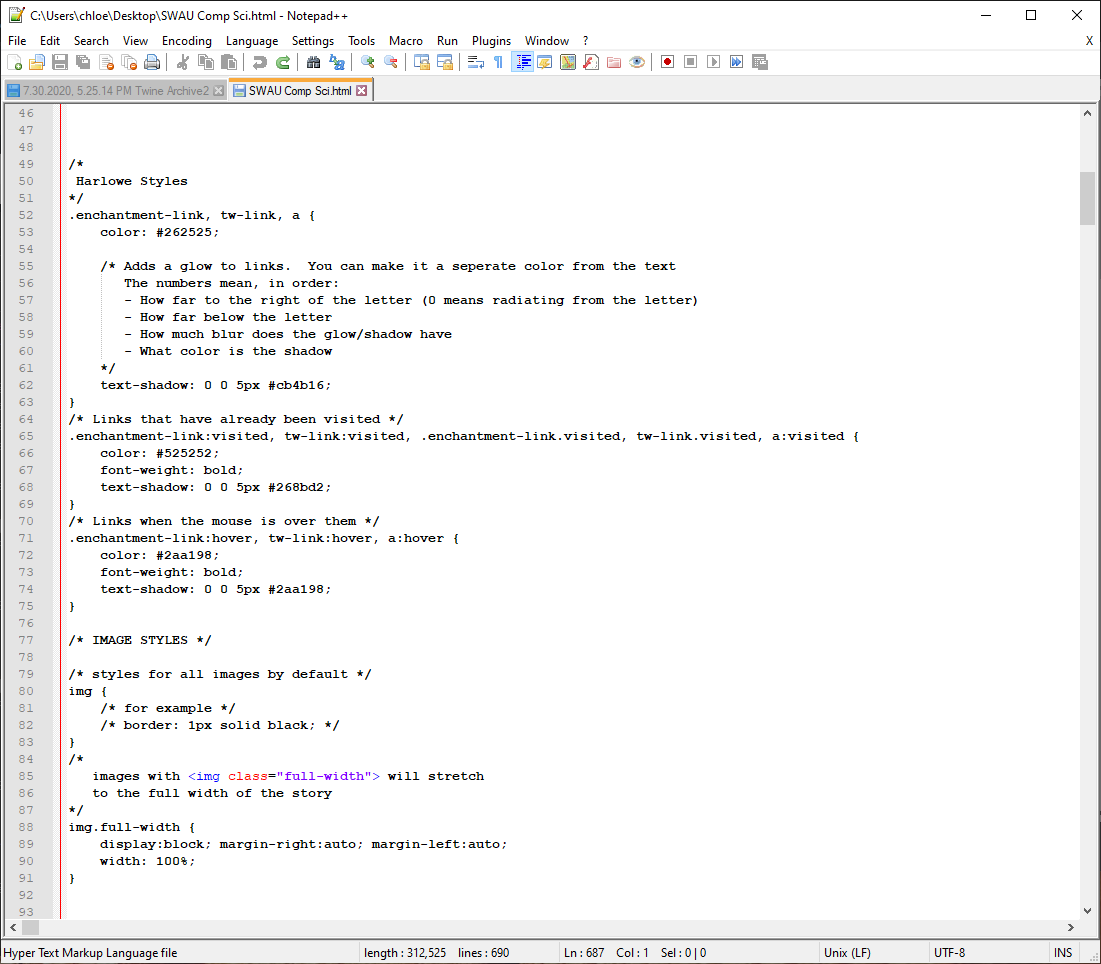
I used Notepad++ to edit the HTML. This is done by publishing the Twine story to a file, or by archiving your Twine stories. They are all saved as .html files, and can be edited with an editor or opened in the default browser.

#### Adding CSS

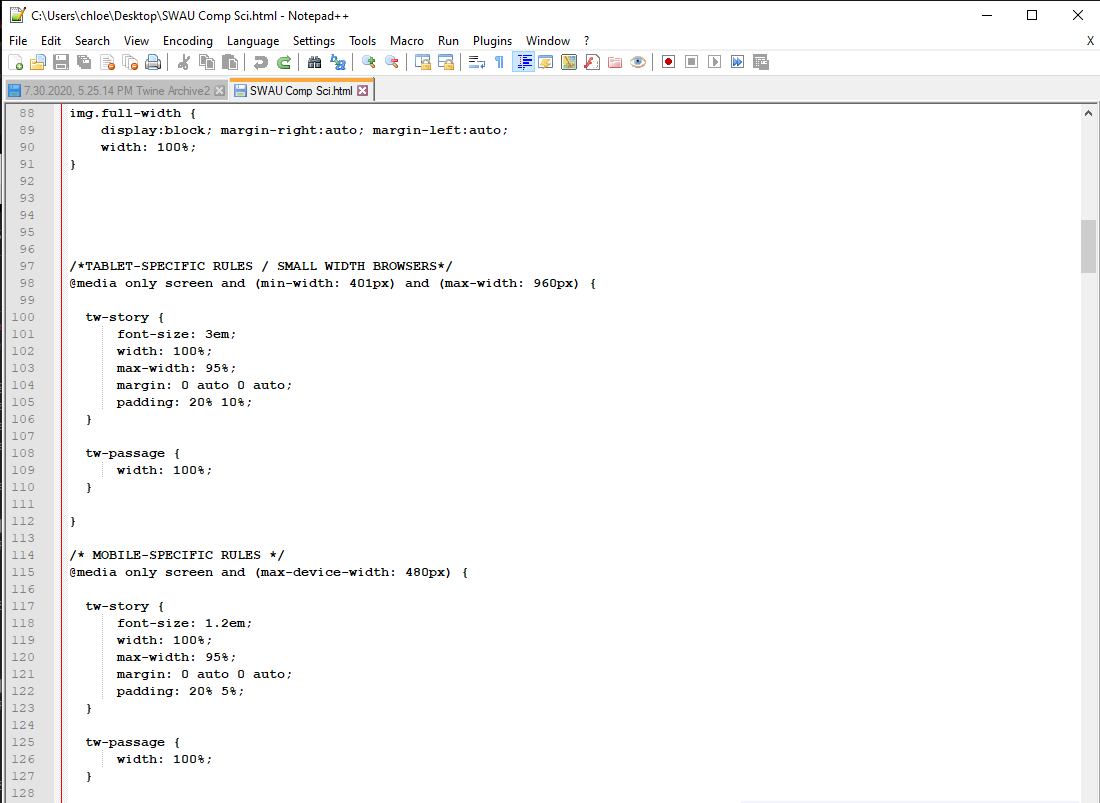
The figures below are adding the CSS and applying it to all the passages. These are global.



(Fig. 7.1)



(Fig. 7.2)



(Fig. 7.3)

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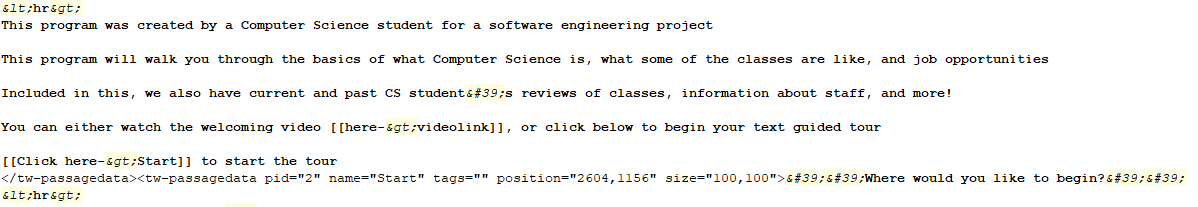
#### 

#### 

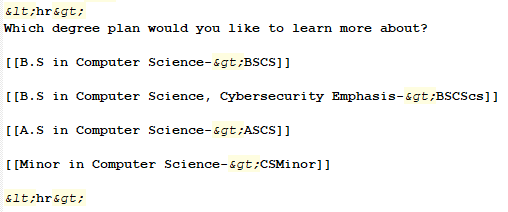
#### 

#### Editing the Passages in HTML

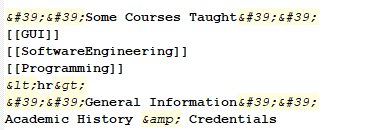
While click and drag is a nice way to design the story, once I got the hang of recognizing the code and shortcuts that Harlowe 2.1.0 uses, adding information directly through the code was simple enough. Below are screenshots of what some passages look like in HTML.



(Fig. 8.1) This is the code for the Welcome Page

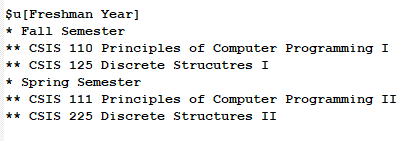


(Fig. 8.2)



(Fig. 8.3)

##### 



(Fig. 8.4)



(Fig. 8.5)

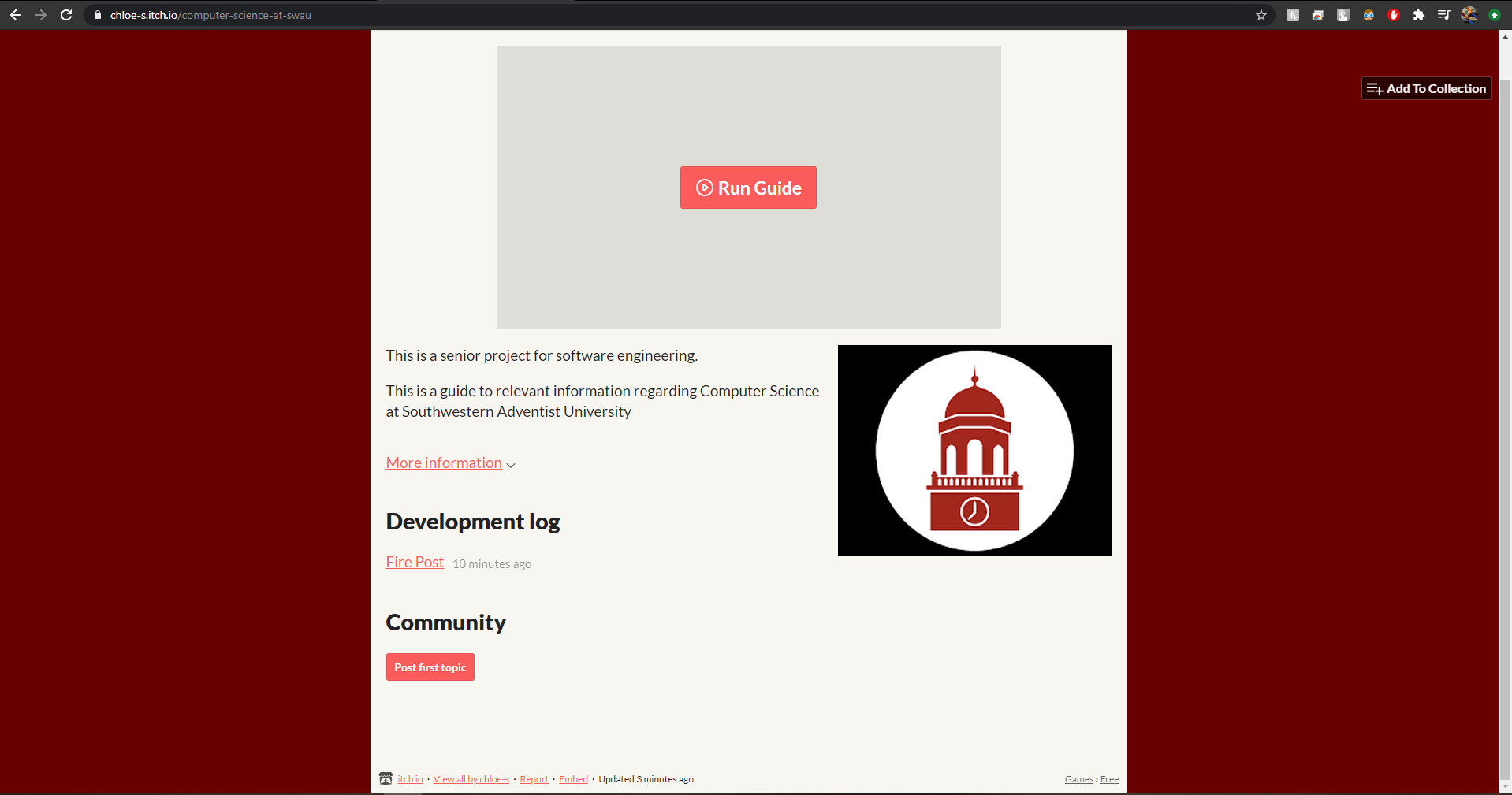
##### Harlowe Key HTML Terms

In the figures above, you may notice some highlighted bits of code. These are Harlowe specific configurations.

* (Fig. 9.1)
  + This is the code for utilizing the HTML term <hr> within a passage. <hr> is responsible for adding a line within the text that spans the width allowed.
* (Fig.9.2)
  + &gt; in this case is used for go-to, indicating that should the text on the left be clicked, the story should jump to the passage listed on the right. You may recognize this as the -> arrow indicator, but in HTML it is &gt;
* (Fig. 9.3)
  + &#39; is used for indicating when an item should be made to appear bold. In the editor UI, this is done by two individual single quote marks ‘ ‘ before and after the desired bold text. Thus, two instances of &#39 side by side, before and after.
* (Fig. 9.4)
  + &amp; is used for adding an ampersand (&) into the text

# Publishing & Maintenance

This will be published to itch.io where it will be free to play. As of July 31, 2020 version 1 is published on itch.io at the following: <https://chloe-s.itch.io/computer-science-at-swau>



(Fig. 10.1)

The code will be published in a GitHub repository at: <https://github.com/chloe-s13/SeniorProject>

Everything will be edited and patched by me. All information will be updated as long as I see fit to.