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Advanced Programming for Mobile Devices

Project Documentation

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1. Background Phase

A student has been given the task of building a functional mobile app which could be used to better their local community or be used for potential business income. To do this, the student must first determine how the app will focus on these prerequisites since an app with more functional purpose can be a more viable product. Once the student has decided on an app idea, they must consider several more factors which will reinforce their choice and promote the direction the app will go such as the purpose of the app, the audience its targeted for and the market demographic. The project will require specific resources on how the app will be built which depends on the style of app, the target devices and the languages used in development. Finally, the student will perform a functionality analysis to discover which aspects are essentially required and which are less vital.

The project will run from January 15th, 2019 and should be completed by March 29th, 2019. The project will go through several stages which will be graded by assessed labs making up the students grade for the module.

1.1. Introduction

The student has decided on building a companion styled mobile web app for the popular massive multiplayer online role-playing game: Old School RuneScape. This merely implies the app will act like an accessible go-to place for what the user requires related to the game. The app will be developed using the WebStorm IDE using HTML5, CSS, JavaScript and the supporting jQuery and jQuery Mobile libraries plus other additional plugin services. The back-end services will be handled by Firebase providing authentication and storage services.

1.1.1. Project Scope

Due to the developer doing other modules for their degree, the app should not be too ambitious but provide some usable functionality which could be improved upon in future if they wish to go ahead and market the app. Since RuneScape is a large MMORPG with various activities, this app could only focus on a certain area to fit within the time allowance of the project. The student believes they should focus on the combat aspect since this has many players and has a personal use for themselves. The student must also take into consideration their skillset with the required languages to ensure it is manageable and not overly complex for them to undertake.

1.1.2. Purpose

Since Old School RuneScape is a large game, the app will focus on the combat aspect which involves the player fighting monsters to gain rewards. This will be done by acting as a guidebook for strategies in fighting the monsters while allowing more room for expansion once the project is

completed or if time permits. The student has chosen to only provide a limited number of guides for the sake of the project due to time constraints as adding every desirable monster would take too long. The design would benefit a mobile app and ensure the information is quickly available without numerous tedious searching which will likely benefit a sizable number of players. The app will link users to other external places for assistance with the game and will offer a simple registration and authentication process allowing them to create and sign into user accounts. Once signed in, users will be able to use the upload feature to store their own content which could lead to other potential uses the app could support. The student could potentially utilise a database to allow more organisation between uploads and users plus allowing room for more functionality.

1.1.3. Motive

The motive of this idea is due to the student's own experiences playing Old School RuneScape. When it comes to fighting monsters there is specific information players require to defeat a monster in the most efficient manner. Searching for these correct methods required going to extra effort to locate the correct information usually from multiple sources which can be time consuming and cause reluctance for players to engage in the activity. This is more troublesome when the player potentially stops playing the game for a lengthy amount of time and has forgotten how to do something properly. The type of information players require includes the correct equipment to bring, the correct supplies and a good method on how to tackle the monster. The reason this information is required is due to newer updates which can change the "meta" or Most Effective Tactic Available. Existing information can become outdated and may not reflect the newer equipment which can alter the method of killing the monster. This point is also supported by the fact all information kept on in-game activities is community written and the company who owns the game has no documentation on how to defeat monsters in an efficient manner.

1.1.4. Market Demographics

For these reasons the student believes the app will gain usage and is therefore enough of a reason to consider providing for native development and redistribution via app stores if it was successful as a web app. This app would be a free application as with knowledge of the game community, they will be unwilling to pay money for 3rd party applications when there's a strong focus on free solutions. This will result in the app potentially bringing in money via advertisements. Since a mobile version of the game released in later 2018, this provides a new influx of potential users who may find convenience using an app to find information. Due to licencing requirements put into effect by Jagex which owns RuneScape, the student would need to request a licence to user their intellectual property legally if intending to market any applications.

1.2. Required Resources

With the student having decided on the app, they now must gather the resources required to properly design, implement and develop the product. This includes the resources used to not only to physically develop the app, but also the designs and relevant documentation. Since languages are considered resources, they will be briefly mentioned as to how they will create the app.

1.2.1. Software & Services

The main software services will be used for both creating documentation, designs and software for developing the product. Services will be used to provide more functionality to the app externally.

1.2.1.1. Microsoft Office

Microsoft Office will support the word processing, project management and design software used to create any relevant documentation and designs throughout the project allowing readers not familiar with the project or its background to understand the purpose of development. Main documentation will be created using Microsoft Word written in a professional way providing clean and clear information. To manage the project, the student will use Microsoft Project which will help others understand how the project intends to progress and ensures they keep on track. This method of planning also allows the student to reschedule tasks if problems or changes arise which promotes a robust management plan. Microsoft Project will also be used to design a task list and a Gantt chart to show readers a more graphical idea of the project's intended development schedule. Finally, Microsoft Visio would be used to design detailed wireframes which explain how the app will work and give a rough idea of its appearance which will aid the student in development. The software may also be used to aid the student in designing some artwork to be used within the app during development.

Since the university provides Microsoft Office 365 containing Word with Visio and Project being available through the Microsoft Inspire Program, there are no costs required for any of these pieces of software.

1.2.1.2. JetBrains Webstorm IDE

To develop the app properly, the student should use an integrated development environment which will provide helpful assistance while developing. The student has chosen to use JetBrains Webstorm IDE to carry out development as it focuses primarily on building web applications. Using this software, the student will be able to use HTML, CSS and JavaScript pages to code the app and then test it in a supported web browser such as Google Chrome. Since the university provides student licences for this software there is no cost to using it.

1.2.1.3. Google Firebase

Firebase is a service provided by Google which mainly provides back-end services for applications on various platforms. Since Firebase is a requirement in the project, the student has opted to utilise the authentication and storage services provided in the free plan. Authentication will be used to handle users signing up to the app service which would give them access to more features such as the upload feature. The authentication will ensure nobody can sign up with the same email address and enforces a password policy promoting safer passwords to be created. Firebase's storage service will store documents, images or other media which can be retrieved or viewed within the app. To organise uploads in a cleaner fashion, the student may opt to also utilise the database feature provided which would allow a better way of recording which user's uploaded specific items to the storage. The database feature may also be useful in other aspects in future additions for the app.

1.2.1.4. Other Services

The student may utilise an RSS Feed on the homepage of their app to provide news from the game's main website although this will require using a service which generates them. The only service that offers a free solution sadly has a 30-day trial period and as such while the feed may work during development and testing, the service will be rendered inactive unless a paid solution is made.

1.2.2. Required Languages

The main languages used during this project will be HTML5, CSS and JavaScript although since it's a mobile app, jQuery and jQuery Mobile will also be utilised to provide mobile services such as touchscreen support plus friendlier GUI icons and layouts.

1.2.2.1. HyperText Markup Language – HTML5

Since the app is a mobile web app, it will work through mobile variants of existing web browsers which all utilise HTML5 to render the content seen. This includes the various buttons that may be used for navigation or the textboxes, tables and general information provided such as the monster guides and images. It's important the student ensures the HTML5 all works properly to ensure the app is useable and elements are organised in a user-friendly way such as using icons or headers on navigational bars, the body of the page for content and the footer to provide any additional services if required.

1.2.2.2. Cascading Style Sheets - CSS

While HTML5 is used to create the content, CSS is used to style them. This allows the student to more accurately position elements on the screen for users and the make them look more appealing using different fonts, colours and padding to ensure everything looks more appealing to the user. Since the app is a companion app for a game, then the colours and styles used could reflect the styles used in the game itself to feel more official and make users more comfortable using the features.

1.2.2.3. JavaScript (jQuery & jQuery Mobile)

JavaScript is used to provide functionality for HTML5 elements, so they can perform tasks or use connected services to give results for the user. JavaScript also has two additional libraries required for this project which are jQuery and jQuery Mobile. jQuery is used to simplify JavaScript programming and enhances features such as animation and event handling. jQuery Mobile is built on jQuery and provides support for mobile devices which are fundamental for this project since it provides the touchscreen features required for mobile users. To use these libraries, the student must either create an external link to them online inside the app via a script or download the local files.

1.3. Functionality Analysis

The functionality analysis will focus on the features that are vital to the app and the features the developer may wish to add if time permits. This section will also list the functional and non-functional requirements.

1.3.1. Functional Requirements

Functional requirements are what are needed to make the app usable hence are vital requirements in the design. Good planning with functional requirements can help improve app quality and user satisfaction.

1.3.1.1. Navigation

This application will feature several pages with information on various monsters within the game which players may want to kill. To access these pages, the app will require functional navigation between them to operate correctly. The vital areas of this are the ability to move between pages although if time permits then navigation to additional services for additional scope may be provided. Navigation within the app will be done via buttons or clickable images which indicate their purpose e.g. the user area will have an icon indicating a head or the back button will have a curved arrow which are commonly used in other places. This will allow users to immediately recognise them and makes buttons more compact without text. Clickable images will have custom art to indicate what they lead to such as a specific monster guide will have a picture of the monster with its name. Hyperlinks will be used to escort users to external services which have additional information for the user. These will again be embedded within images or buttons to keep the global styling consistent and appear tidier compared to a typical hyperlink.

1.3.1.2. Content

The focus of this application will be Player versus Monster so there will be a sizable amount of content available to users. Each page is dedicated to different entries and aspects of this area of the game and should be tested and ensured the content is available for users to use. This also relates to navigational buttons with labels referencing the topic or name for the page it links to. The content held via Firebase must be fully tested and checked otherwise it may become non-accessible. The type of information stored would be various types of media such as images and video but also written text. To hold content, collapsible tabs may be used to sequence information to prevent the user being overloaded with information. Another potential use would be AJAX to allow users to navigate between different instances of information without reloading the page which would speed up the rate the user can decide which information they wish to see and give greater satisfaction with the product.

1.3.1.3. Functionality

Functionality will relate to the more complex tasks the app is aiming to do such as user authentication and file storage. Most of this functionality will be done by Firebase itself although there is some JavaScript that needs to help it do what it needs to. The app may link into social media or other external services for additional information. If time permits, then more areas of the game could be implemented, and a database system may be required to store more details for specific activities.

1.3.2. Non-Functional Requirements

Non-Functional Requirements are how the application will behave when running and have no impact on its functions. Non-functional requirements can improve the application overall providing a subtle but better user experience.

1.3.2.1. Performance

Performance with the application will vary for users although this will be mainly down to the quality of their mobile device, their internet connection and their choice of browser. Older devices may appear to take longer to load or perform actions which can also be due to slower internet speeds. Internet browsers can process style sheets differently and as such the app may appear differently in specific browsers. Other areas that could affect performance are the Firebase services if there is a connectivity issue which could be a problem linked to poor internet connection. Overall since majority of the app's content is embedded, there will be little loss of functionality if an internet connection is lost.

1.3.2.2. Scalability

Since the application links with Firebase, it means if the developer decided to market the application then additional space could be gained by using a paid subscription. This would allow the app to scale accounts and storage space depending on how much is being used. This may also relate to the event that further functionality or features are added to improve the experience such as adding in another area of the game which would increase users by providing diversity.

1.3.2.3. Storage

Users may be able to upload their own media to the app for safe keeping which can add up when more users use the app. This causes problems as users may upload more media than others and the space will only be used on a first-come-first-served basis unless accounts have upload limits to provide everyone an equal opportunity. If the application is ever marketed this again could be mitigated by having a subscription with Firebase.

1.3.2.4. Availability

Due to this application being a mobile web app, the user should ensure they have a decent active internet connection to use all the features. Users might be unable to utilise the Firebase services otherwise and any hyperlinks within the application may also be unavailable although the app can still provide much of its services without a live connection.

1.4. Development Methodology

To ensure development is as efficient and consistent as possible, the student has chosen to follow a developmental approach while building their app. The chosen approach is the Agile approach due to it being better suited toward software development. This is because with other methods such as Waterfall, end results cannot be seen until development is finished which makes going back and changing or fixing aspects much tougher and more time consuming. Agile on the other hand works in sprints for smaller yet important tasks before reviewing the work when completed. This allows much more testing during development to ensure less flaws are discovered during the final testing phase and allows the product to become more robust. As an example, the student could create all the navigation and then test it all works to ensure all pages are reachable. If this wasn't tested until the end, then much of the content may be inaccessible and would take time to look through code to find the problem.

1.5. Table of Dependences

Task Name	Duration	Start	Finish	Predecessors
Planning Phase	**6 days**	**Tue 15/01/19**	**Tue 22/01/19**	
Decide on an App Idea	0.5 days	Tue 15/01/19	Tue 15/01/19	
Gather Information	1 day	Tue 15/01/19	Wed 16/01/19	2
Gather Resources	1 day	Wed 16/01/19	Thu 17/01/19	3
Introduction	0.5 days	Thu 17/01/19	Thu 17/01/19	4
Task List	1 day	Fri 18/01/19	Fri 18/01/19	5
Functional Requirements	1 day	Mon 21/01/19	Mon 21/01/19	6
Non-Functional Requirements	1 day	Tue 22/01/19	Tue 22/01/19	7
Prototype Design Phase	**6 days**	**Wed 23/01/19**	**Wed 30/01/19**	**1**
Design UseCase Diagram	3 days	Wed 23/01/19	Fri 25/01/19	
Design Application Interface Diagrams	3 days	Mon 28/01/19	Wed 30/01/19	10
Design Implementation Phase	**6 days**	**Thu 31/01/19**	**Thu 07/02/19**	**9**
HTML5	1 day	Thu 31/01/19	Thu 31/01/19	
CSS3	2 days	Fri 01/02/19	Mon 04/02/19	13
JavaScript	2 days	Tue 05/02/19	Wed 06/02/19	14
Firebase Services	1 day	Thu 07/02/19	Thu 07/02/19	15
Implementation Phase	**18 days**	**Fri 08/02/19**	**Tue 05/03/19**	
Physical Design (HTML5)	**6 days**	**Fri 08/02/19**	**Fri 15/02/19**	**12**
Design Pages	2 days	Fri 08/02/19	Mon 11/02/19	
Design Interfaces	4 days	Tue 12/02/19	Fri 15/02/19	19
Functionality (JavaScript)	**6 days**	**Mon 18/02/19**	**Mon 25/02/19**	**18**
Configure Firebase Authentication	3 days	Mon 18/02/19	Wed 20/02/19	
Configure Firebase File Storage	3 days	Thu 21/02/19	Mon 25/02/19	22
Visuals (CSS3)	**6 days**	**Tue 26/02/19**	**Tue 05/03/19**	**21**
Configure Fonts, Styles and Sizes	6 days	Tue 26/02/19	Tue 05/03/19	
Testing Phase	**6 days**	**Wed 06/03/19**	**Wed 13/03/19**	**1,9,12,18,21,24**
Physical Design	1 day	Wed 06/03/19	Wed 06/03/19	
Test Interfaces	1 day	Thu 07/03/19	Thu 07/03/19	27
Test Services	2 days	Fri 08/03/19	Mon 11/03/19	28
Provide Testing Evidence & Explain	2 days	Tue 12/03/19	Wed 13/03/19	29
Evaluation Phase	**6 days**	**Thu 14/03/19**	**Thu 21/03/19**	**26**
Critical Analysis	1 day	Thu 14/03/19	Thu 14/03/19	
Explain Potential Changes	1 day	Fri 15/03/19	Fri 15/03/19	32
Review Documentation	2 days	Mon 18/03/19	Tue 19/03/19	33
Review Project for Submission	2 days	Wed 20/03/19	Thu 21/03/19	34

Figure 1. Table of Dependencies

1.6. Gantt Chart

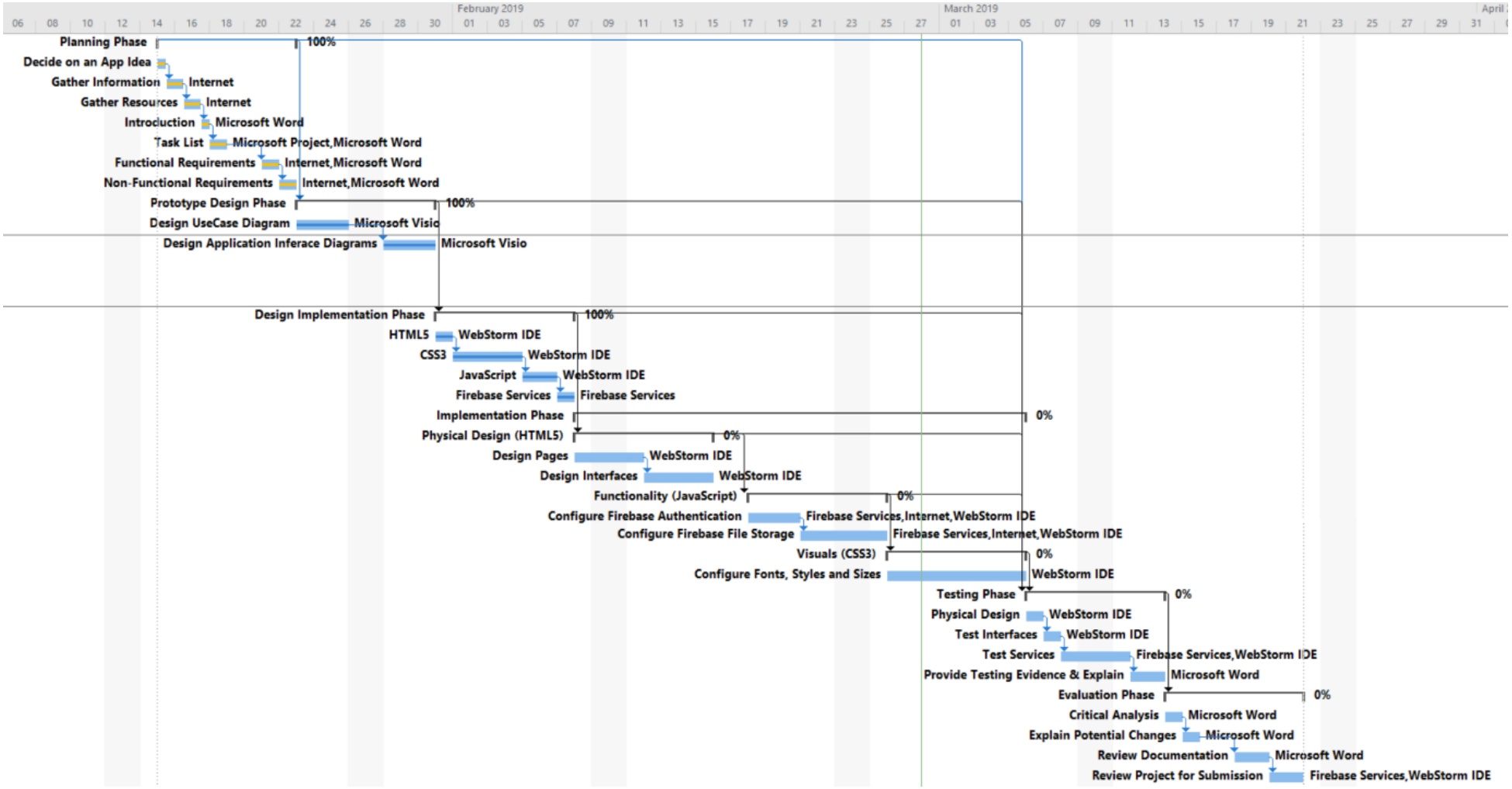


Figure 2. Project Schedule as a Gantt Chart

1.7. Risk Register

Category	Name	No.	Probability	Impact	Mitigation	Contingency	Action When
Schedule	Scope Creep	1.	Medium	Project falls behind	Stick to pre-planned features	Reschedule and abandon extra features to focus on more important elements	When schedule starts to fall behind.
Schedule	Underestimating required time	2.	Medium	Project falls behind	Research into requirements properly	Reschedule and potentially discontinue some features.	When schedule starts to fall behind.
Resources	Internet Unavailable	3.	Low	Limited progress and research	Ensure research is completed early	Relocate to an area with a usable connection, utilise a library or ask others for assistance.	When or if default internet connection becomes unavailable.
Resources	Firebase Services Unavailable	4.	Low	Application will lack backend services	Research into other methods in case	Utilise a backup method to host services.	Firebase becomes unusable.
Resources	WebStorm Issues	5.	Low	Application may take longer to develop	Research into requirements for WebStorm	If mitigation fails, utilise another development environment	WebStorm causes too many issues and affects schedule.
Human Error	Implementation issues	6.	Medium	Application may not function properly	Research into required languages to understand syntax correctly	Reschedule and research more into complete specific tasks.	When an issue takes longer than expected.
Project Deliverables	Data lost or Corrupted	7.	Low	Project may fall behind to various degree	Ensure backups are regularly made	Utilise a backup or if unavailable reschedule and repeat completed work	Data lost or becomes corrupted.

Figure 3. Risk Register

2. Prototype Design Phase

The student must now use the gathered resources to design concepts of their app. This will mean learning good practices when designing apps and looking at many existing examples to gain inspiration in layouts, colours and themes. The student will design some wireframe concepts which will detail a basic structure of how the app will appear and explain how pages link together. Once done, a UseCase diagram will be designed to explain how the app will function and handle processes. To find relevant inspirations, the student will look through the current examples of companion styled apps in the app store. During their search, they found existing apps that inspired various features, layouts or themes that could be used in their own product.

2.1.1. Old School Companion – by Dennyy

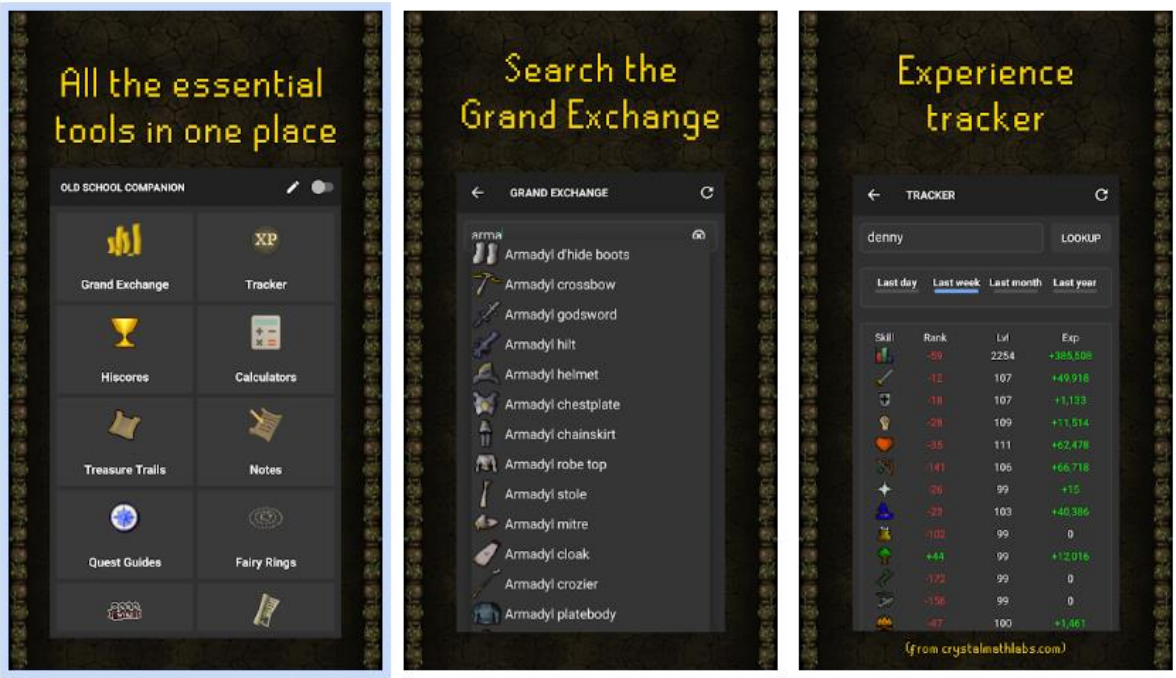


Figure 4. Old School Companion – by Dennyy

This app took the students attention mainly with the navigational method of using buttons with images and text to indicate what each section holds as content. The app follows the visual styling of the game with the yellow text and darker brown colours for the themes. The darker slates and greys are uniform throughout the app making it relational to the official game and its website while ensuring text is easily readable making it a very robust looking app. Navigational icons such as back arrows and refresh are clear in their intent of telling a user what they do providing simple yet clear navigation through the pages within the app.

2.1.2. Old School RuneScape Barrows Guide – by TGUK

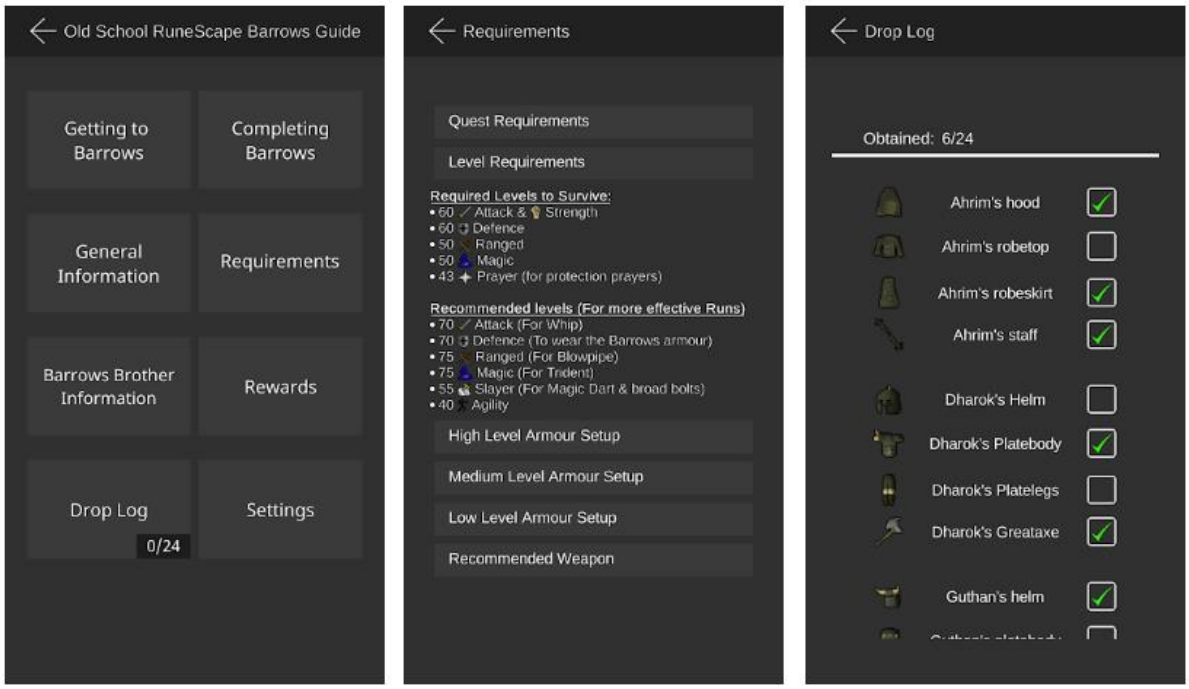
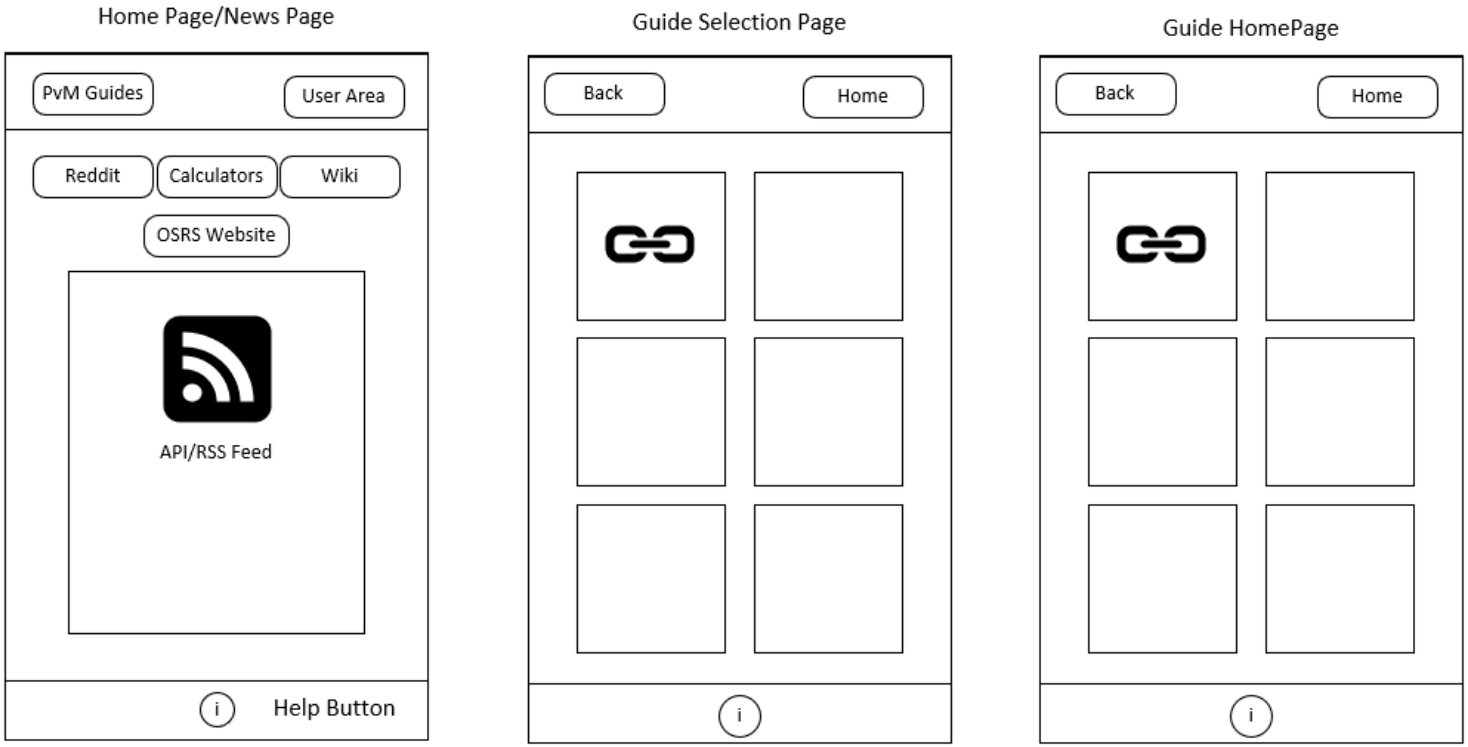


Figure 5. Old School RuneScape Barrows Guide – by TGUK

Another app aimed at a specific aspect of the game, more in line with the student's intentions. This app focuses on a specific set of monsters and guides user on killing them. The student liked the simplicity of this app with its similar navigational method compared to the previous example along with its simple no fuss way of organising information. The drop log feature inspired the student to add a similar feature to their app as it provides some self-reward to the user if they manage to find any rewards after using the app. The app lacks any unique colouring or themes relating to the main game or its website although the information clear and easy to read. The navigational icons are similar with back arrows indicating what they do, and buttons are clearly labelled.

It's notable none of these apps require any of firebases services nor do users need to create any accounts although the first example can retrieve a user's game account data. While these apps are robust, the student intends their app to provide more functionality in future which may require user profiles and authentication security to protect their content. Uploaded images can be used in conjunction with the in-app content if the included content becomes outdated.

2.2. Wireframe Interface Concepts



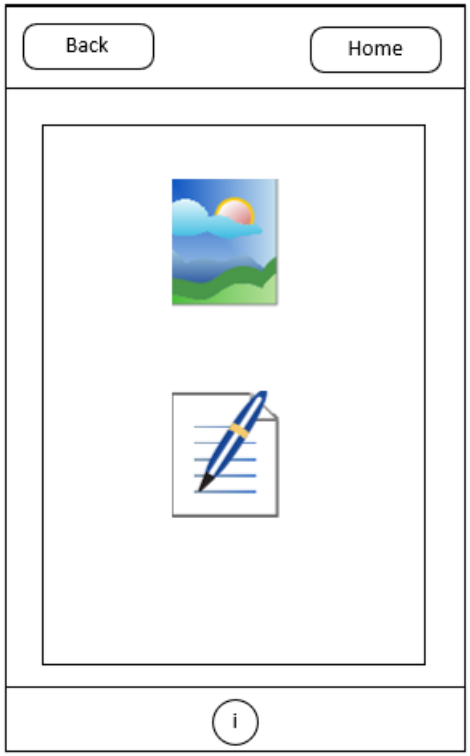
The Homepage is where users first appear when loading the app. Users can access the Guides through the PvM Guides button.Through an RSS Feed, latest news from the official Old School RuneScape website will be displayed on this page. Users can access external social media and tool resources from here also

The Guide Selection Page will list images of various images of monsters in the game. These images can be clicked on to take the user to that specific guide.

The Guide Page will list topics of various of various steps users should take to preparing and killing the specific monster in the game. These images can be clicked on to take the user to that specific step.

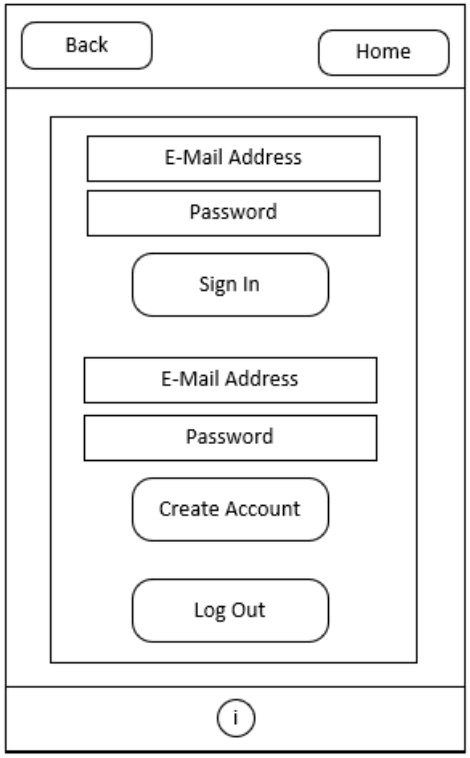
Figure 6.1 Wireframes

Guide Step Pages



Guide Step Pages are what will appear when a user clicks on a specific step of their chosen guide. These pages will contain various multimedia ranging from text, images or videos to express how to properly complete that step.

User Area: Sign in/Up



The Sign In page is where users can log into their accounts or create one. They can also log out from here when finished with the application. Firebase Authentication handles this feature.

User Area: Storage

When logged in, users can access their personal storage and upload area. They can upload files to Firebase's storage service.

Figure 6.2 Wireframe (continued)

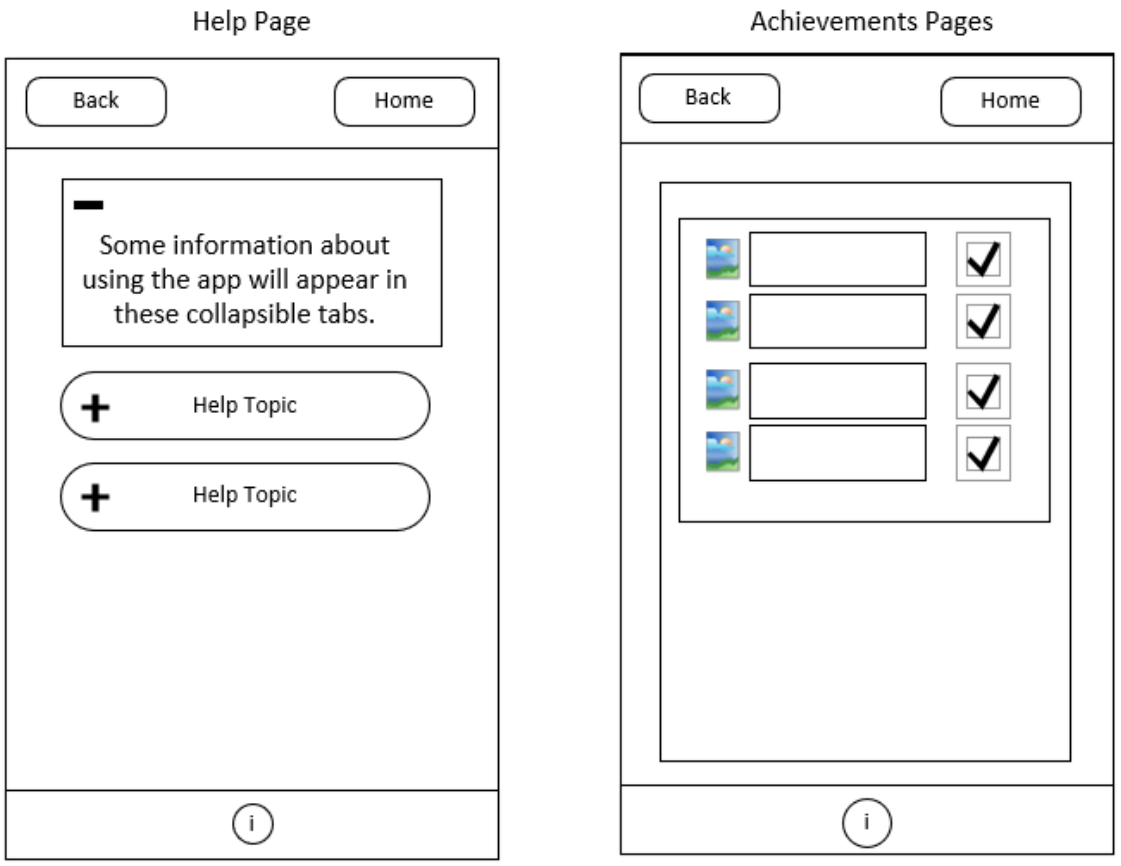


Figure 6.3. Wireframes (continued)

2.3. UseCase Diagram

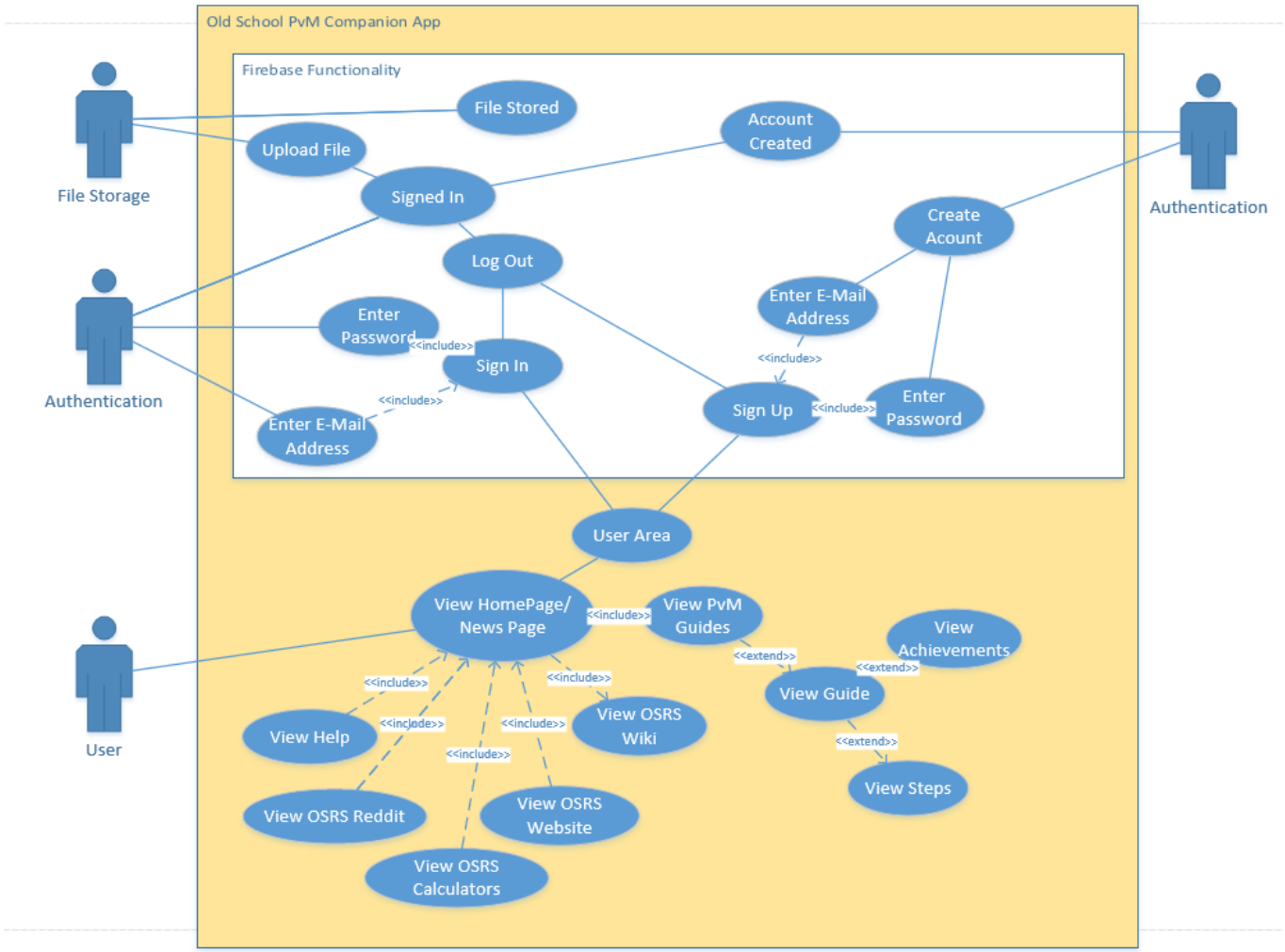


Figure 7. UseCase Diagram

3. Design Implementation Phase

To express how the language used during development of this app work, the student has created some rough pseudocode to provide examples and has created a class diagram to express how it all links together.

3.1. HTML

Majority of the application will be coded with HTML. The app will handle references to other files within the <head></head> section and majority of the app will be coded in the <body></body> section.

First, references to the stylesheets for both jQuery Mobile and the CSS file need to be created:

```
<link ”stylesheet” hypertext reference ”link to online jQuery CSS file”/>
<link ”stylesheet” type=”text/css” hypertext reference css/”name of app’s css file name”/>
```

The app must also link to Firebase’s online services and activate them within the app via scripts:

```
<script src=”link to online firebase JavaScript file”></script>
<script>
  var config = {
```

These listed services are provided by Firebase with unique links to the specific project.

```
    apiKey: This links Firebase to the specifically configured services
    authDomain: Handles the user authentication
    databaseURL: Links to the Database
    projectId: The project id setup on Firebase
    storageBucket: This is where uploaded files will be stored
    messagingSenderId:
  };
  firebase.initializeApp(config);
</script>
```

Finally, links to the local JavaScript jQuery and jQuery Mobile files used within the app are required for them to function:

```
<script src=”file locations and names.js”></script
```

The rest of the code will be entered in the main body. Each page within the application will have an identifier or “id” which can be attached to buttons to take them to that specific page. Each page then will have a header, content and footer area which allows the app’s code to be more organised and cleaner. The code is divided using the “div” tag to allow some CSS editing.

Within the header there will be code which gives some text to show the user a topic or name of the page their on via heading fonts and links pages to pages via buttons:

e.g. <h1>PvM Guides</h1> This will show a header with PvM Guides as the text.
e.g. Home This will show a button along the header with the text “Home” inside which redirects the user to the linked page when clicked on.
e.g. <a href="#" data-rel="back" This displays a button in the header which takes the user back to the previous page they were on.

3.1.1. Image Links

The content on each page will vary, although there are several ways interactions will be handled the first being by image links. These will be used commonly throughout the app which allow users to view information in sections rather than all at once which can put them off reading everything.

e.g. <img src=”images/image.jpg” width=??? Can be measured in either pixels or percentages>

The above example shows first a reference to another page in the app with the name “KQguide” which would contain the content for that specific monster guide. The title just labels it a name that wouldn’t be seen unless the connected image file was broken or unavailable. The image is also formatted to be a specific width to fit the page better along with the other guide links. In the app, the user will see the picture of the boss and click on it to be redirected to that guide.

3.1.2. Collapsible Tabs

These are useful for opening and hiding specific content without cluttering a page with information which on mobile apps can cause prolonged scrolling. Opening and closing these tabs allows users to see what they wish to see and hide what they don't require which makes the app smoother and cleaner to use.

```
e.g.
<div data-role="collapsible">
<h5>Title</h5>
<img src=”images/image.jpg” width”160”/>
<p>Text</p>
<table>
 <tr>
  <th>Weapon</th>
  <th>Helmet</th>
 </tr>
 <tr>
  <td>Abyssal Whip</td>
  <td>Serpentine Helmet</td>
 </tr>
</table>
```

As shown above, many types of content can be added to collapsible tabs although this content can also just be shown as default without them depending on the situation.

3.1.3. Authentication

To allow users to interact with the functionally done via JavaScript and Firebase which allows them to either make an account on the app or to log in/out, there needs to be some HTML to present it to the user:

```
<input type="email" placeholder="Email..." id="email field" />
<input type="password" placeholder="Password..." id="password field" />
<button onclick="login()">Login to Account</button>
<button onclick="logout()">Logout</button>
```

This code here shows there are input fields present which in this case require an email address and a password to be entered before clicking the button to login. When the user is done using the app, they can click the logout button to safely sign out.

3.1.4. File Storage

For users to upload their own files once signed in, they need an interface to do so:

```
<input type="file" class="upload" id="upload file" size="50" name="icon"
onchange="loadFile(this);">
```

When users click on the upload button they will be promoted to select a file they wish to upload. Once selected, the app will upload the file into Firebase's storage bucket for that user.

3.2. CSS

The ability to customise how the app's features appear can be impactful for users as it can improve the finished quality of the app making it robust and professional with consistency in colouring, fonts, styles and backgrounds.

3.2.1. Page Customisation

These are examples of some elements that can dictate how a specific object or page can appear to the user:

```
background-image: url("../images/image.jpg");
background-size:
background-color:
border-color:
color:
font-family:
font-weight:
text-shadow:
```

3.2.2. Customising Specific Objects

Much of the pages seen within the app will be editable within divided sections or “div” tags. This means specific elements within can have unique customisation unlike the rest of the app which may follow a standard that is global throughout the app. The below example is a rough estimate of how the upload bar would be configured.

```
#myBar {
  width:
  height:
  background-color:
  text-align:
  line-height:
  color:
}
```

The previous mention of using divisions in the HTML earlier is to make editing specific objects easier. The width and height of the bar must fit properly within the screen size and the colour can be changed to show progress as an item is uploaded which shows feedback to the user.

3.3. JavaScript

The true functionally of the app is done with JavaScript which will handle the authentication and storage upload services ensuring they work properly for the user.

3.3.1. Authentication

First, the app needs to check if a user is alright signed in or not which would be handled by an if statement:

```
if (user) {
  // User is signed in.
```

- App will check the divisions to verify if a user has correctly entered the fields.
- App will consider this the current user and Firebase will authenticate them.

```
  var user = firebase.auth().currentUser;
  if(user != null){
```

- App grabs element by id and outputs “Welcome User: + email id”

```
} else {
  // No user is signed in.
```

- To allow users to log in properly, the user must enter the correct fields which JavaScript will use to authenticate them:

```
function login(){
App will grab the input from the email field
App will grab the input from the password field
firebase.auth().signInWithEmailAndPassword(userEmail, userPass)
      // Handle Errors here.
App error code
App error message
App will generate an alert window “Error: “+ errorMessage to let the user know there’s a problem.
}
```

- e.g. wrong email + correct password, wrong email + wrong password, correct email + wrong password, invalid input (unallowed characters such as $%^& symbols)

When users wish to sign up to the app, they will need to enter their desired email and a password to use like existing users although they must ensure the new email isn't already taken.

```
function signUp(){
App will grab input from new email field
App will grab input from new password field
firebase.auth().createUserWithEmailAndPassword(userEmail, userPass)
      // Handle Errors here.
App error code
App error message
App will generate an alert window "Error: "+ errorMessage to let the user know there's a problem.
}
```

- e.g. invalid characters or email already taken.

To log out, the user merely needs to click the logout button which will allow Firebase to safely sign them out of their account.

```
function logout(){
   firebase.auth().signOut();
}
```

3.3.2. File Storage

For users to successfully upload files to firebase storage:

```
function loadFile(input) {
var elem = User must use button to select a file to upload
var filetoUpload= the selected file or files will be ready to upload
var storageRef = firebase needs a storage reference to know where to send the files
var task = storage reference is set and file upload is executed
function progress(snapshot){
var percentage = progress bar will display
if any issues happen the upload will fail and error
function complete(){
var downloadURL = a hyperlink should appear providing the user a method of retrieving the files
```

3.4. Class Diagram

The class diagram below shows how each of the functional pages connect to one another with purposeful associations. The top row indicates a page or entity while the 2nd indicates objects the user would interact with on it while using the app such a using buttons or input boxes. The 3rd row shows functions the app will perform to do tasks such as moving between pages, signing in or expressing how the invisible services operate such as how firebase auth authenticates users.

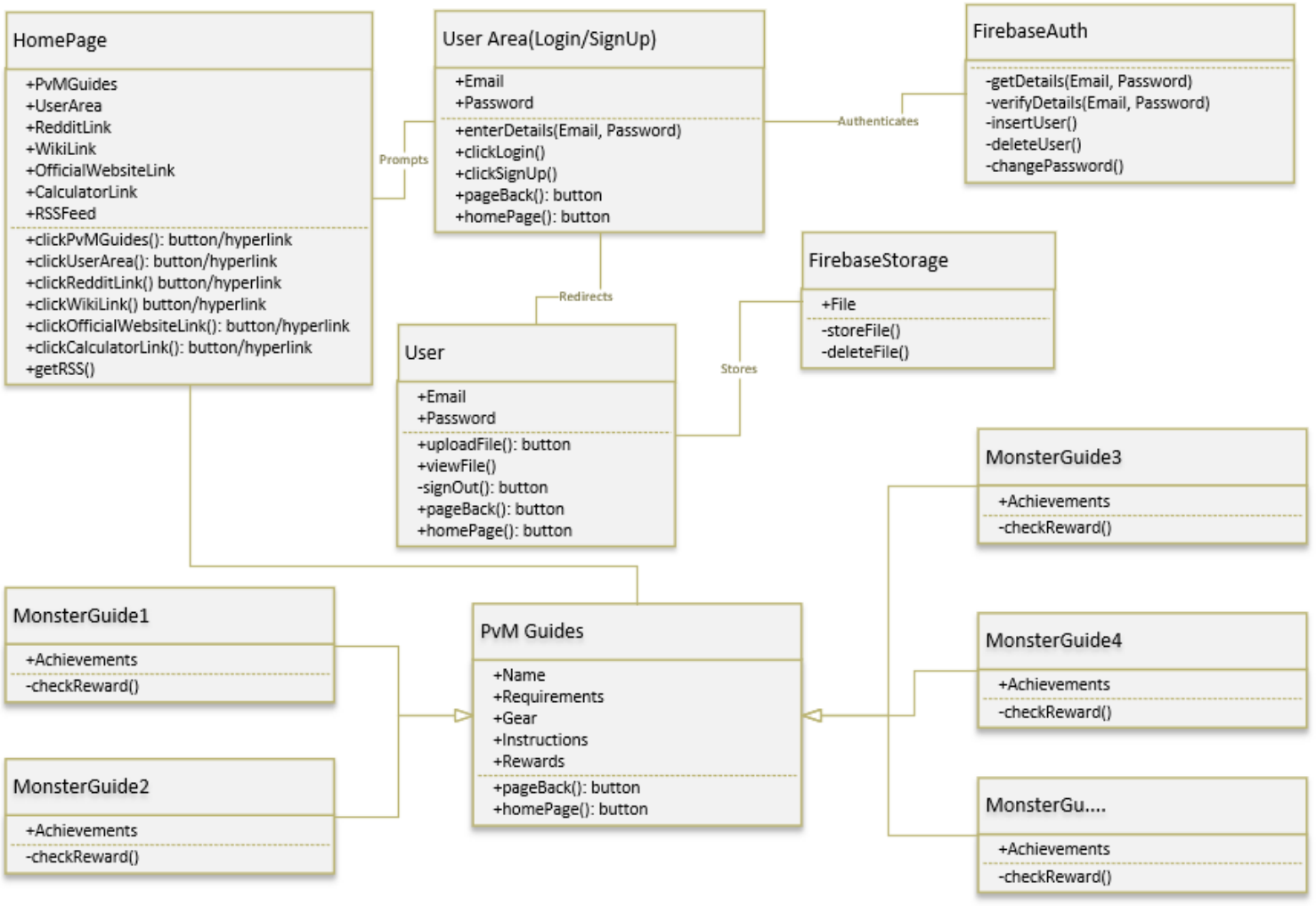


Figure 8. Class Diagram

4. Implementation Phase

With all the planning and designing completed. The student can now begin using WebStorm to code the product. This will realistically be done back and forth between languages and pages to ensure specific connected features work although for this documentation, each language will be separated to give better understanding.

4.1. Physical Design (HTML5)

To have anything to work with, the student must first create the shell of the app which will include the pages the content belongs to along with any interfaces in which a user may need to use. The student will initially need to start a new project in WebStorm and name it before adding a HTML page and naming it. This is where majority of the code will rest and will be where most other pages are referenced to be usable. Each relevant aspect will be covered in their related section.

4.1.1. Creating Pages

To design the pages, the student creates them by giving them naming references as mentioned earlier in the planning phase. To provide some examples, the code of a few pages will be shown and explained. The entire code will be featured in the Appendices section.

```
<!-- HomePage -->
<div data-role="page" id="homepage">
    <div data-role="header">
        <h1>OSRS PvM Tool</h1>
        <a href="#userArea" data-icon="user" data-iconpos="notext"></a>
        <a href="#help" data-icon="info" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
      <img src="images/osrstitle.png">
        <br>
        <br>
        <a href="#guides"><img src="images/osrsguides.jpg"width=160 data-
role="button"></a>
        <a href="#extras"><img src="images/osrsextras.jpg"width=160 data-
role="button"></a>
        <br>
        <h2>Latest News</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
                <div id="rssincl-box-container-1210180"></div>
                    <script type="text/javascript"…>
                <br>
        </div>
    </div>
</div>
```

Figure 9. Homepage Code

To create a page, the student must ensure a division is created which covers the whole page before giving it the data role “page”. This identifies as to what it is within the app before an identifier is assigned to it in this case “homepage”. Once the page is created then the divisions for the header, content and footer can be created. To keep the app consistent, the header and footer will be uniform throughout the app in layout with only button changes being present depending on the user’s location within the app. The header will maintain the app’s name throughout all pages as seen by “<h1>OSRS PvM Tool</h1>”. The buttons along the top of the header will mainly be either return or home buttons unless the homepage is the user’s location in which case the buttons will be the user area page and the information page as seen above in the “href” tags below the title on Figure 9. These icons are built into the jQuery Mobile library of which there are numerous to choose from for various purposes.

The content of each page will vary and mostly be tailored specifically to the specific monster guide although many will be dedicated to user navigation due to the number of monsters and specific steps to give enough information to the user. The extras page uses hyperlinks to other external websites associated with the game or its community via image buttons e.g. <img src="images/osrswebsite.jpg" width="160"> is a link to the Old School RuneScape main website followed by an image named “osrswebsite” which keeps the code clearer and easier to read.

```
<div data-role="content" align="center">
    <h2>PvM Guides</h2>
    <div data-role="container" align="center" style="background-color: darkkhaki">
        <br>
    <a href="#kalphiteQueen"><img src="images/kaphitequeen.jpg"width=160 data-
role="button"></a>
    <a href="#kingblackdragon"><img src="images/kingblackdragon1.jpg"width=160
data-role="button"></a>
    <a href="#chaosElemental"><img src="images/chaoselemental.jpg"width=160 data-
role="button"></a>
    <a href="#dagannothKings"><img src="images/dagannothkings.jpg"width=160 data-
role="button"></a>
    <a href="#giantMole"><img src="images/giantmole.jpg"width=160 data-
role="button"></a>
    <a href="#corporealBeast"><img src="images/corporealbeast.jpg"width=160 data-
role="button"></a>
        <br>
        <br>
    </div>
</div>
```

Figure 10. PvM Guides Content Code

As seen in Figure 10. above, the PvM guides page hosts links to the guides within the app via a similar method as used on the homepage although unlike those, these use page references. As mentioned earlier, the homepage was assigned an id “homepage” so if a button is to take a user to that page they must reference it e.g. “#homepage”. Figure 10. shows this working for the included guides in the app with each named with a reference identifying the monster it’s based on. To ensure the image buttons remain tidy in on the screen, the student has aligned the content within the division to be aligned to the centre to allow various screen sizes to correctly display them.

```
<!--Kalphite Queen Guide-->
<div data-role="page" id="kalphiteQueen">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>Kalphate Queen Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#kq1" title="1. Getting There"><img…
        <a href="#kq2" title="2. The Fight"><img…
        <a href="#kq3" title="3. Recommended Skills"><img…
        <a href="#kq4" title="4. Equipment"><img…
        <a href="#kq5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#kq6" title="6. References"><img…
            <br>
            <br>
        </div>
    </div>
</div>

<!--KQ 1. Getting There-->
<div data-role="page" id="kq1"…>


<!--KQ 2. The Fight-->
<div data-role="page" id="kq2"…>


<!--KQ 3. Recommended Skills-->
<div data-role="page" id="kq3"…>


<!--KQ 4. Equipment-->
<div data-role="page" id="kq4"…>


<!--KQ 5. Loot-->
<div data-role="page" id="kq5"…>


<!--KQ 6. References-->
<div data-role="page" id="kq6"…>
```

Figure 11. PvM Guide Example Code

Figure 11. shows when a user selects a guide from the PvM Guides page. The sections for the guide appear and each have references to their stages. As seen here each subpage has been organised in with titles to ensure the student doesn't get lost in the many lines of code for each guide. As seen above, the header now shows buttons that are more common throughout the app such as "back" and "homepage".

4.1.2. Creating Interfaces

With the HTML5 pages all created and configured, there are a few interfaces that need to be coded to ensure all content included on a specific page is accessible. This will be mainly via collapsible tabs, tables and checkboxes. Textboxes are also required to take user input when signing in or signing up.

```
<div data-role="content">
    <div data-role="collapsible">
        <h5>About</h5>
        <p>This app was developed by Paul Walker for their Advanced Programming for
Mobile Devices Module while attending The University of the West of Scotland.
            <br>
            <br>
            This app is designed as a companion styled guide for killing specific
monsters on Old School RuneScape.</p>
    </div>
```

Figure 12. Collapsible Tab Example

As seen above in Figure 12., collapsible tabs are created when the data role is defined as collapsible. When a user first encounters a collapsible tab, it will be closed with a header to identify what it contains as in the above example <h5>About</h5> will be displayed. Any content can be placed inside a collapsible tab such as text to images or interactive content. The user must tap on the title box of the collapsible tab to close it again to save space on their screen if they wish since multiple opened tabs will cause more scrolling which can bore users.

```
<div data-role="content">
    <table data-role="table" class="ui-responsive">
        <thead>
        <tr>
            <th>Item Name</th>
            <th>Item Image</th>
            <th>Obtained?</th>
        </tr>
        </thead>
        <tbody>
        <tr>
            <td>Dragon Chainbody</td>
            <td><img
src="images/pixel%20art/kalphite%20queen/Dragon%20chainbody.png"></td>
            <td>
                <input type="checkbox" name="checkbox-0" data-mini="true">
            </td>
        </tr>
```

Figure 13. Table with Checkbox Example

Tables are a useful means of holding information for users although when it comes to mobile screens they can be more of a problem due to size. The student decided to use tables to hold specific rewards and their images along with a checkbox option they can select to act as a self-reward system. To use tables efficiently for mobile devices, jQuery mobile assists with its "responsive" tables which simply mean they adapt to the screen size and present the information accordingly. The checkbox input as seen in Figure 13. can be created by naming the input with the "checkbox" type although for mobile devices, its best to ensure the data-mini attribute is set to true to ensure it fits on screens properly.

```
<div data-role="content" id="login_div" class="main-div">
    <h3>Sign In</h3>
    <input type="email" placeholder="Email..." id="email_field" />
    <input type="password" placeholder="Password..." id="password_field" />

    <button onclick="login()">Login to Account</button>
</div>
```

Figure 14. Log into Account HTML

To catch user input for user accounts, there must be input boxes representing the information the user must enter. In the above case in Figure 14., the student has provided two input boxes for both email and passwords. The placeholder text is what appears in the box before the user has entered any input to show what they must enter in that specific box. The identifier is required to be used within the JavaScript configurations later.

To make the app as mobile friendly as possible, the student has ensured that content is usable from both portrait or landscape views. Images included in the app will be interactive and will display a zoomed in version of them in a popup window to make them easier to read, in this case some images are better zoomed in while in landscape mode to ensure the maximum visibility is available. Figure 15. shows this.

```
<div align="center">
    <a href="#popupkqloc" data-rel="popup" data-position-to="window" data-
transition="fade"><img class="popphoto" src="images/kqlairloc.JPG" alt=""
style="width:30%"></a>
    <a href="#popupkqdirections" data-rel="popup" data-position-to="window" data-
transition="fade"><img class="popphoto" src="images/kqlairmap.jpg" alt=""
style="width:30%"></a>
    <div data-role="popup" id="popupkqloc" data-overlay-theme="b" data-theme="b"
data-corners="false">
        <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-shadow ui-btn-a
ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img class="popphoto"
src="images/kqlairloc.JPG" style="max-height:512px;" alt="">
    </div>
    <div data-role="popup" id="popupkqdirections" data-overlay-theme="b" data-
theme="b" data-corners="false">
        <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-shadow ui-btn-a
ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img class="popphoto"
src="images/kqlairmap.jpg" style="max-height:512px;" alt="">
    </div>
</div>
```

Figure 15. Popup Images Code Example

4.2. Functionality (JavaScript)

JavaScript handles much of the processes within the app that allows firebase to work along with the authentication and file storage services. To enable firebase to work with the app, the student must create a project on firebase and link it within the code with a script file:

```
<script src="https://www.gstatic.com/firebasejs/5.8.3/firebase.js"></script>
<script>
        // Initialize Firebase
        var config = {
            apiKey: "AIzaSyAaeq_V2dCykTZeVxI3puE9CveLrN2j3Og",
            authDomain: "runescape-companion-app.firebaseapp.com",
            databaseURL: "https://runescape-companion-app.firebaseio.com",
            projectId: "runescape-companion-app",
            storageBucket: "runescape-companion-app.appspot.com",
            messagingSenderId: "1018461035899"
        };
        firebase.initializeApp(config);
</script>
<script src="authentication.js"></script>
<script src="storage.js"></script>
<script src="js/jq/jquery-1.11.1.min.js"></script>
<script src="js/jq/jquery.mobile-1.4.5.min.js"></script>
```

Figure 16. Firebase, JavaScript & jQuery/jQuery Mobile Scripts

As mentioned earlier in the planning phase, Firebase must have its configuration imported to link with the app. The configuration is held in a script which is written in JavaScript. Firebase advises that only required services be referenced in the configuration for a live app as it will improve efficiency hence in a live run, the service that wouldn't be required would be the "messagingSenderId" along with the "databaseURL" although as previously mentioned, may be used in future. The JavaScript files created in the project for authentication and storage are also linked to the HTML page via scripts along with the jQuery and jQuery Mobile libraries.

4.2.1. Configure Firebase Authentication

To continue with Figure 14 in the previous section, Figure 17 displays the JavaScript used to allow users to log into their user accounts.

```
function login(){

    var userEmail = document.getElementById("email_field").value;
    var userPass = document.getElementById("password_field").value;

    firebase.auth().signInWithEmailAndPassword(userEmail,
userPass).catch(function(error) {
        // Handle Errors here.
        var errorCode = error.code;
        var errorMessage = error.message;

        window.alert("Error : " + errorMessage);
        // ...
    });
}
```

Figure 17. User Login JavaScript Code

First, as mentioned in the pseudocode earlier, the email and password variables must be taken from whatever the user types into the text fields. The identifiers as seen in Figure 14. are present as the fields the information will be taken from. Firebase auth is then referenced and the specific sign in method is utilised along with error catches.

4.2.2. Configure Firebase File Storage

The file storage feature uses a similar method of gaining input from the user:

```
function loadFile(input) {

    //Defining element to show the progress
    var elem = document.getElementById("myBar");
    var filetoUpload=input.files[0];

    //Initializing the reference of database with the filename
    var storageRef = firebase.storage().ref(filetoUpload.name);

    //Uploading file
    var task = storageRef.put(filetoUpload);
    task.on('state_changed',
        function progress(snapshot){
            var percentage = snapshot.bytesTransferred / snapshot.totalBytes * 100;
            //uploader.value = percentage;
            elem.style.width = parseInt(percentage) + '%';
            elem.innerHTML=parseInt(percentage)+'%';
        },
        function error(err){

        },
        function complete(){
            var downloadURL = task.snapshot.downloadURL;
        }
    );
}
```

Figure 18. File Storage Code

Firstly, as mentioned in the pseudocode the app needs a place for the user the select a file to upload then it will pass the selected file along to prepare for upload. The “myBar” reference will be where users tap to select a file upload. Firebase will need to ensure it has a reference for storage when its uploaded before it can start otherwise the process will fail. The app will then upload the file and give the user output showing upload progress in the progress function. This will create a percentage and display it on the progress bar. If the upload fails, then the process with fail with an error but if it completes successfully then a hyperlink should appear for the user should they wish to download it again.

4.3. Visuals (CSS3)

With functionally in place, the app will be fully operational although without CSS, nothing would look appealing or in place for a user to make use of efficiently.

4.3.1. Configure Fonts, Styles and Sizes

As mentioned earlier in the planning phase, it's important for an app to follow consistency in theme and style throughout the app yet also be relevant to the topic the app is about. The student decided it was best to follow the colour scheme of the main game's website which consists of mainly darker colours such as grey slates, dark red and some browns. The other colours included are also slightly lighter such as yellows and parchment colours to give the feel of the game's theme. The student has also selected a suitable font style for the app to ensure the content is readable yet feels in place within the app's theme.

```
.ui-page-theme-a .ui-btn,
html .ui-bar-a .ui-btn,
html .ui-body-a .ui-btn,
html body .ui-group-theme-a .ui-btn,
html head + body .ui-btn.ui-btn-a,


.ui-page-theme-a .ui-btn:visited,
html .ui-bar-a .ui-btn:visited,
html .ui-body-a .ui-btn:visited,
html body .ui-group-theme-a .ui-btn:visited,
html head + body .ui-btn.ui-btn-a.ui-btn:visited {
    background-color: darkred;
    border-color: #1a000d;
    color: #ffffff;
    text-shadow: 0 1px 0 #000000;
}


.ui-page-theme-a .ui-btn:hover,
html .ui-bar-a .ui-btn:hover,
html .ui-body-a .ui-btn:hover,
html body .ui-group-theme-a .ui-btn:hover,
html head + body .ui-btn.ui-btn-a:hover{
    background-color: darkred;
    border-color: #1a000d;
    color: #ffffff;
    text-shadow: 0 1px 0 #000000;
}


.ui-page-theme-a .ui-btn:active,
html .ui-bar-a .ui-btn:active,
html .ui-body-a .ui-btn:active,
html body .ui-group-theme-a .ui-btn:active,
html head + body .ui-btn .ui-btn-a:active  {
    background-color: red;
    border-color: white;
    color: #000000;
    text-shadow: 0 1px 0 #ffffff;
}
```

Figure 19. Button CSS Example

As seen above in Figure 19., there is a lot of configuration and thought into how aspects will look. The buttons in the example are given different colourings depending on their state when the user is interacting with them. The buttons are configured with a pre-set theme, their state and where they are in the app e.g. body. The state as shown above can be when the user taps on a button it changes colour to show it registered the input. When a user closes a tab but hasn't selected anything else the colour should also be different to indicate what is currently still in selection. These aspects are important to show how responsive the app is although these features aren't required for the app to function, they can be vital for selling an app as a product since nobody will want to use a poorly customised app.

```
#myProgress {
    width: 100%;
    background-color: #ddd;
    text-align: center;
}
#myBar {
    width: 0%;
    height: 30px;
    background-color: #4CAF50;
    text-align: center;
    line-height: 30px;
    color: white;
}

.rss {
    position: absolute;

}
.content {
    text-decoration-color: darkgoldenrod;
    position: absolute;
}
```

Figure 20. Other CSS Configurations

Identifiers can also be customised such as the progress indicator and the file upload bar. The RSS feed that was inserted on the homepage also has editing to ensure its position is absolute regardless of screen size to ensure it fits for all devices. The content indicator ensures all content in the body of pages will also remain in place along with their central alignment in the HTML.

5. Testing Phase

With the app mostly functional in comparison to the design, the student must now do a full test on the features. This includes everything from basic checkboxes being usable to being able to log in properly. The student will provide screenshot evidence of the tests in case problems occur in future that render some services unavailable.

5.1. Testing Physical Design

Testing the physical design requires ensuring that all pages follow the proposed design suggested in the planning phase, any changes will be mentioned in the evaluation phase. The design must also work with multiple devices to ensure compatibility in both portrait and landscape views.

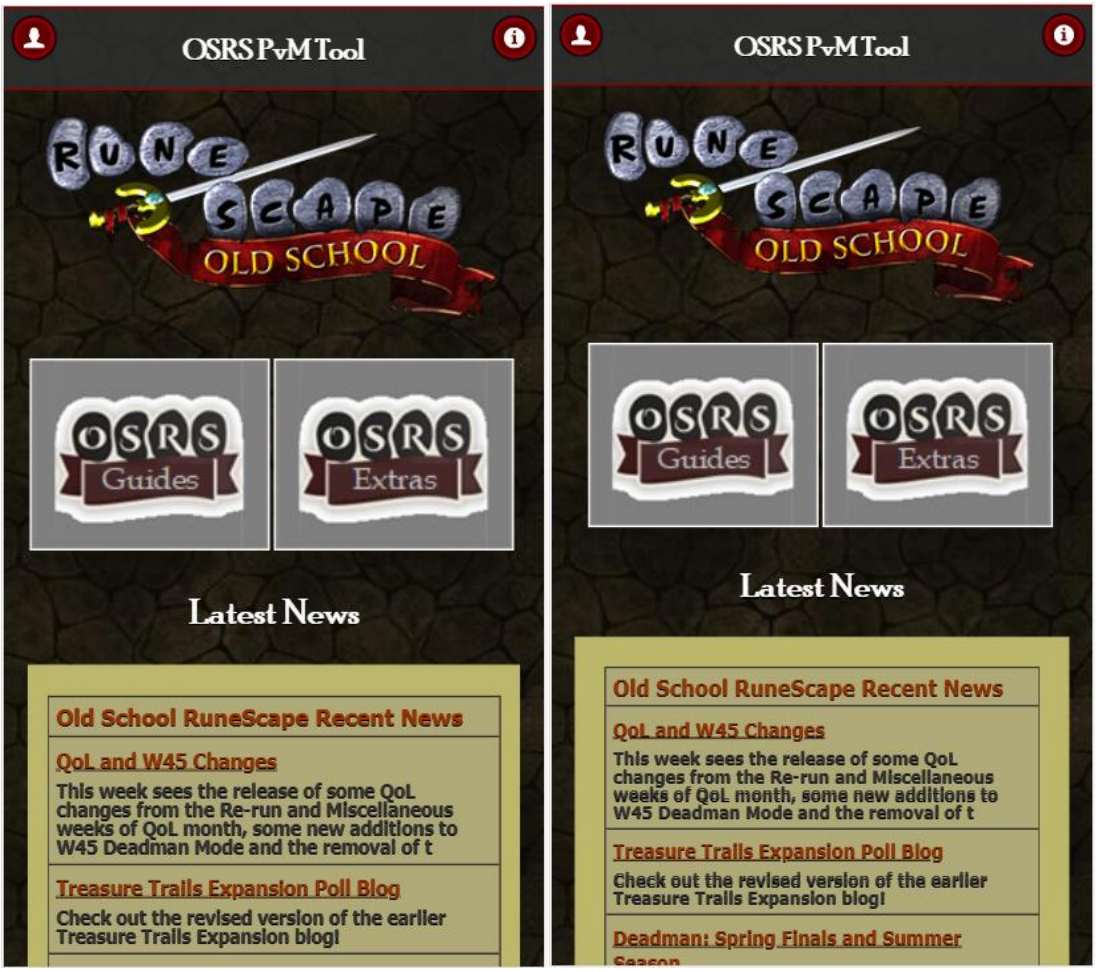


Figure 21. Homepage Views (Galaxy S5 & iPhone 6/7/8)

As seen above in Figure 21., the images still maintain their content positionings despite being on different devices. The only piece of content on the homepage that won't be as responsive is the RSS feed due to it being hosting by a 3rd party service, its size is manually determined but it's been checked to ensure it will easily fit on portrait views of all phones.

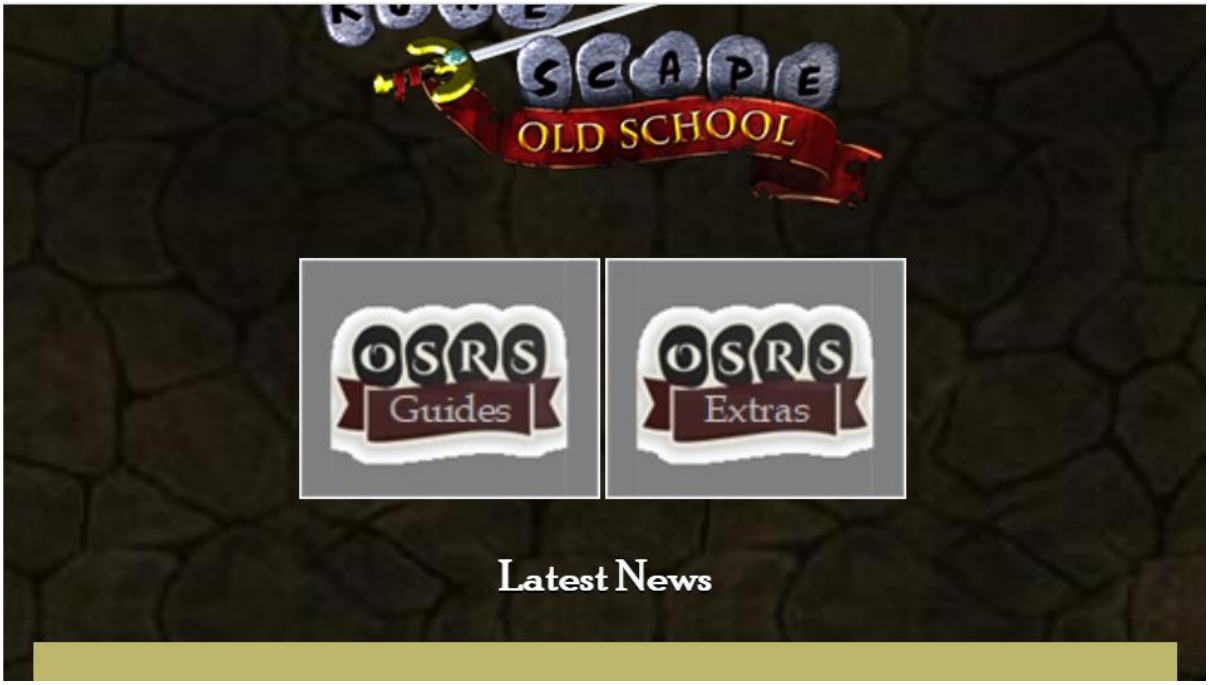


Figure 22. Landscape view of the homepage (Galaxy S5)

The above Figure 22. shows the elements on the page retain their positions even in a landscape view ensuring everything is centred regardless of device. The styling of the page shares a combination of both the games main website and of the inspirational apps. The website background and khaki coloured container both show resemblance to the main website along with the game's logo at the top of the screen to give familiarity. The image was taken slightly scrolled down the page which is why the top image looks cut.

5.2. Testing Interfaces

The interfaces included in this test will be the buttons that take the user to other pages within the app along with the collapsible tabs, popup images and tables.

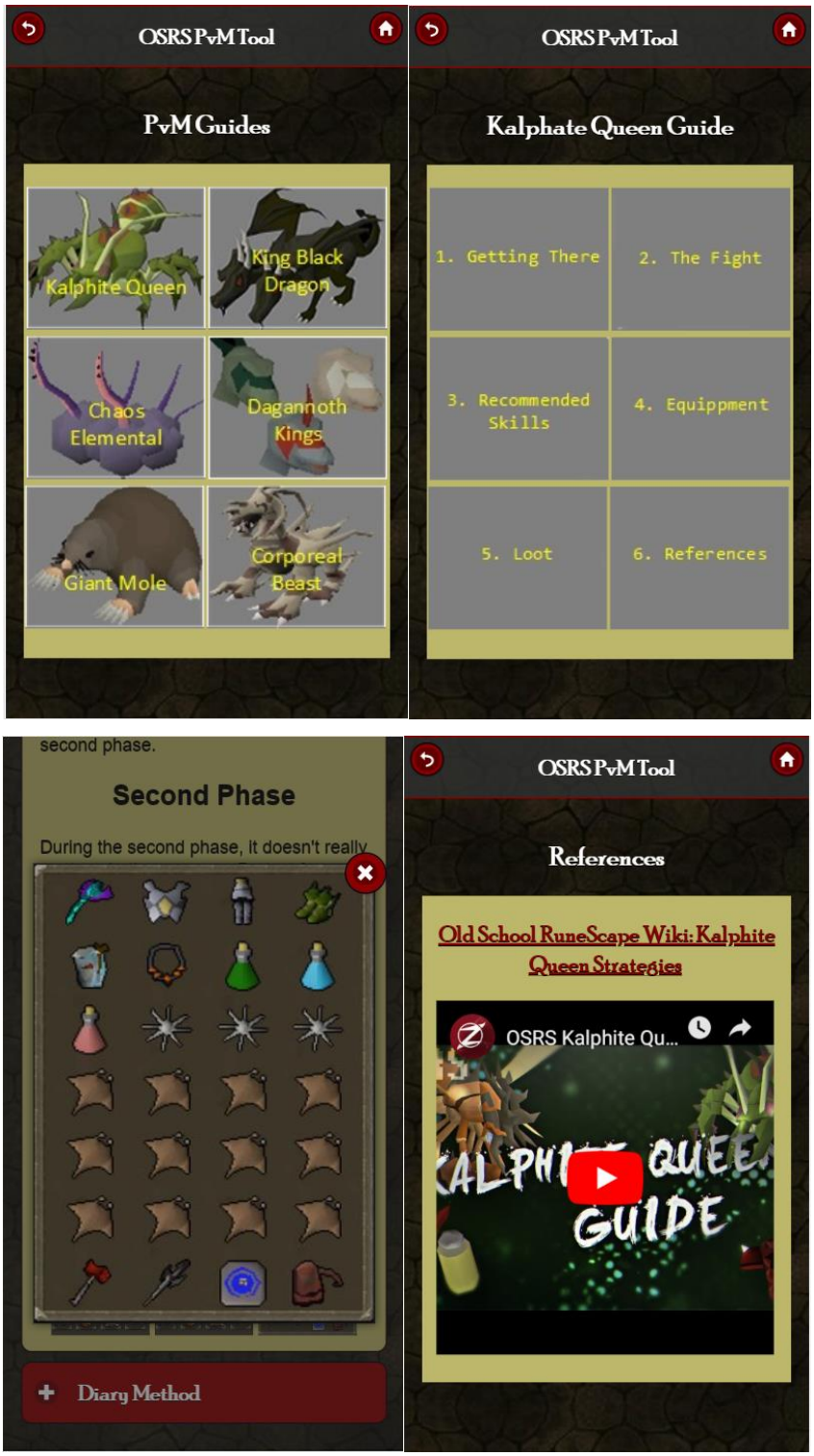


Figure 23. Navigation and Interface Testing 1

Figure 24. Navigation and Interface Testing 2

As seen above in Figures 23. and 24., the app can easily transverse pages via the relevant buttons along with collapsible correctly opening and closing to users will. The popup images display clearly along with external content such as the RSS feed and YouTube videos. The checkbox features on the app also allow ticks to be registered correctly against each item.

5.3. Testing Firebase Functionality

To ensure firebases authentication functionality works correctly, the student will create an account then attempt to log in with the account a 2nd time with incorrect details. Signing up a 2nd time with the same email will also be checked. Some of these results will be shown in the appendix section.

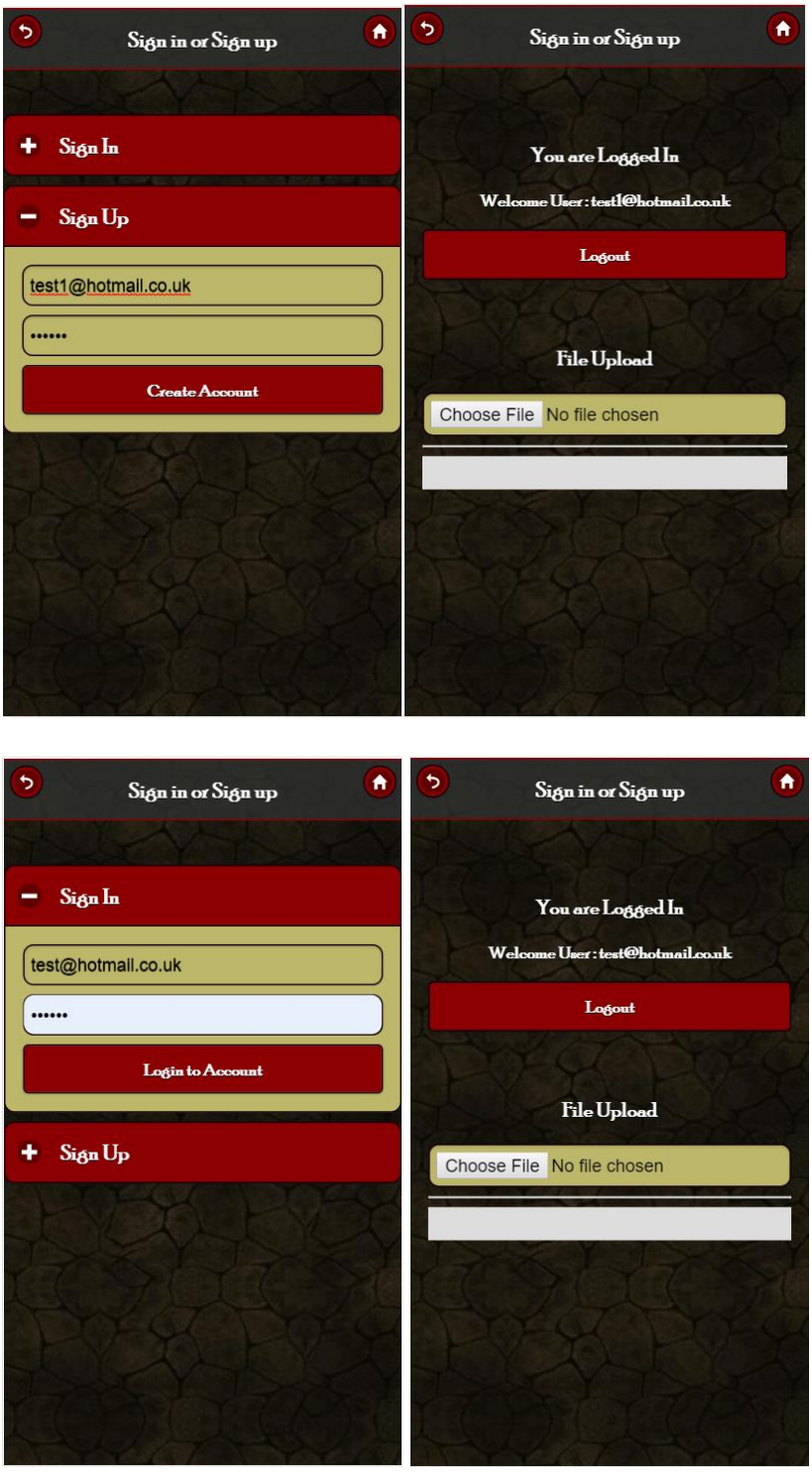


Figure 25. Testing Sign Up, Log in and Logout Features

In the above Figure 25., the student created test1@hotmail.co.uk to sign up to the firebase service with a password of 6 characters. The student was then able to successfully log into their account. This then allows the upload interface to display since it isn't viewable without logging in with an account. The next test shown the user log in with an existing account test@hotmail.co.uk to check if logging is possible with the correct credentials. It must be known at this point of testing that authentication only works without security rules as the student has not figured out how to ensure how it works when enabled.

The next test would be on the file upload and storage service which will be done by attempting to upload an image.

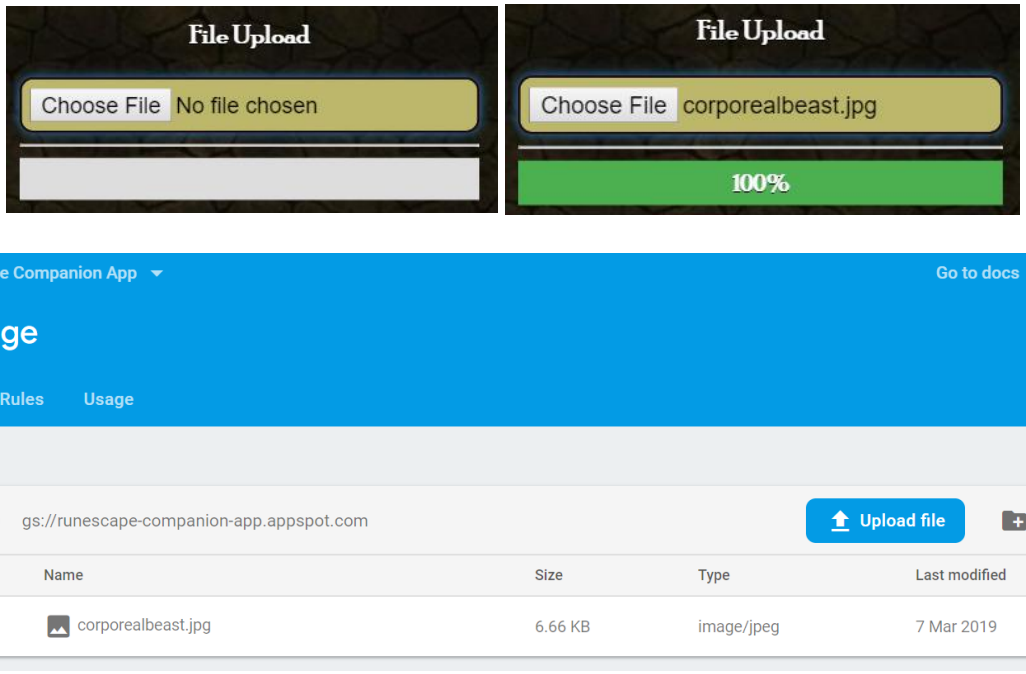


Figure 26. File Upload and Storage Test

As seen in Figure 26., the user first must select a file by tapping on the choose file button, this will allow them to search for a file they wish to upload. Once selected, the filename will appear, and the progress bar will begin to fill indicating how complete the process is. Once completed, the student went to check their firebase console to check if the file had uploaded to which it had.

While the users can upload files, the student was unable to figure out how to ensure they can view uploaded images, download them again or ensure users can only upload when signed in.

5.4. Testing Other Services

With the RSS feed in place, testing it works properly will mean waiting until the next weekly update for the game since usually there are only one or two updates a week. To prove this, the top most article is the most recent, the student will know the RSS feed updates properly if the newest article will appear on the feed after the main website posts it. Figure 27. And Figure 28. provide results.

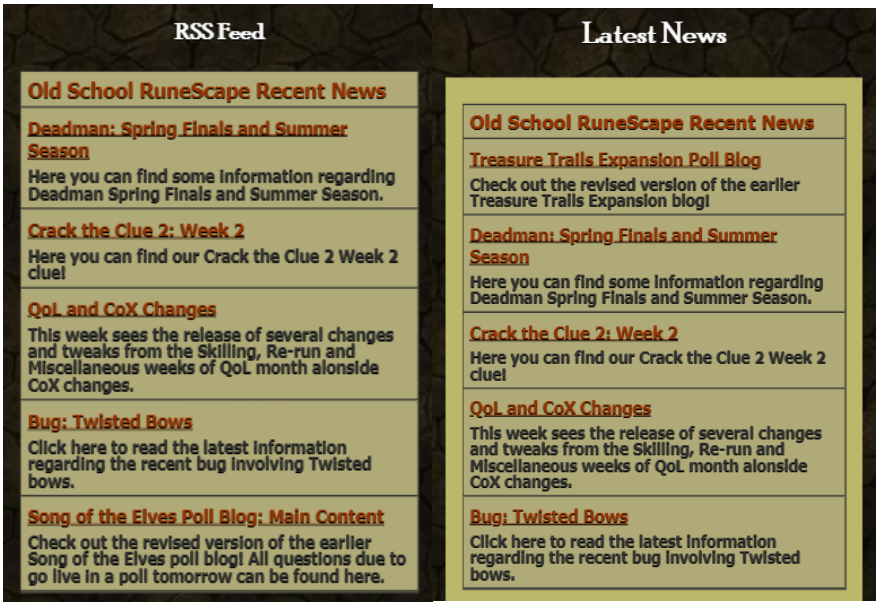


Figure 27. RSS Feed Test 1 (05/03/19) & RSS Feed Test 2 (06/03/19

Figure 28. RSS Test 3 (07/03/19)

To ensure external services can be reached via image, video or text hyperlinks, each will be tested to check if they correctly link to their destination, play content plus if the correct button is linked to the correct link.

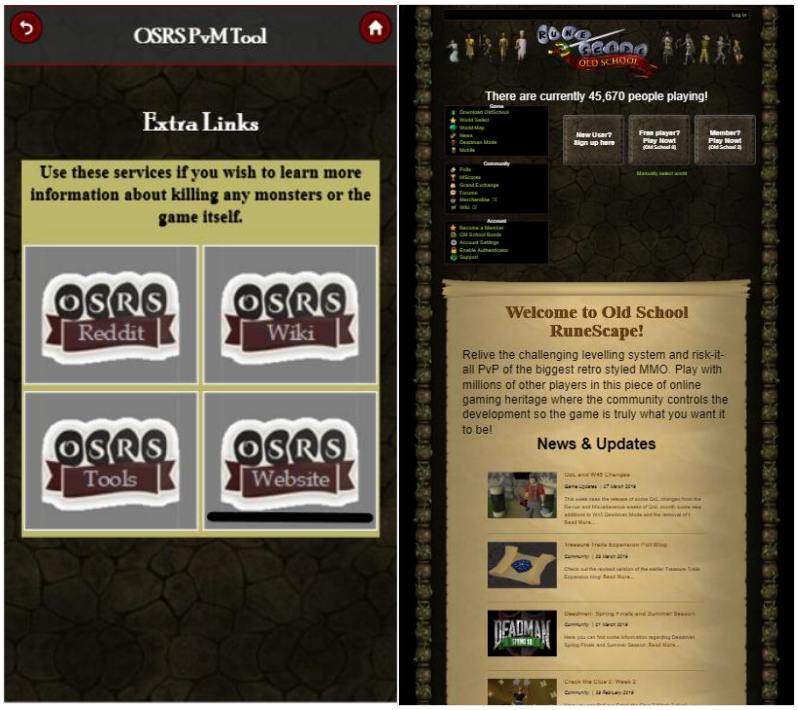


Figure 29. External Link Test (Images)

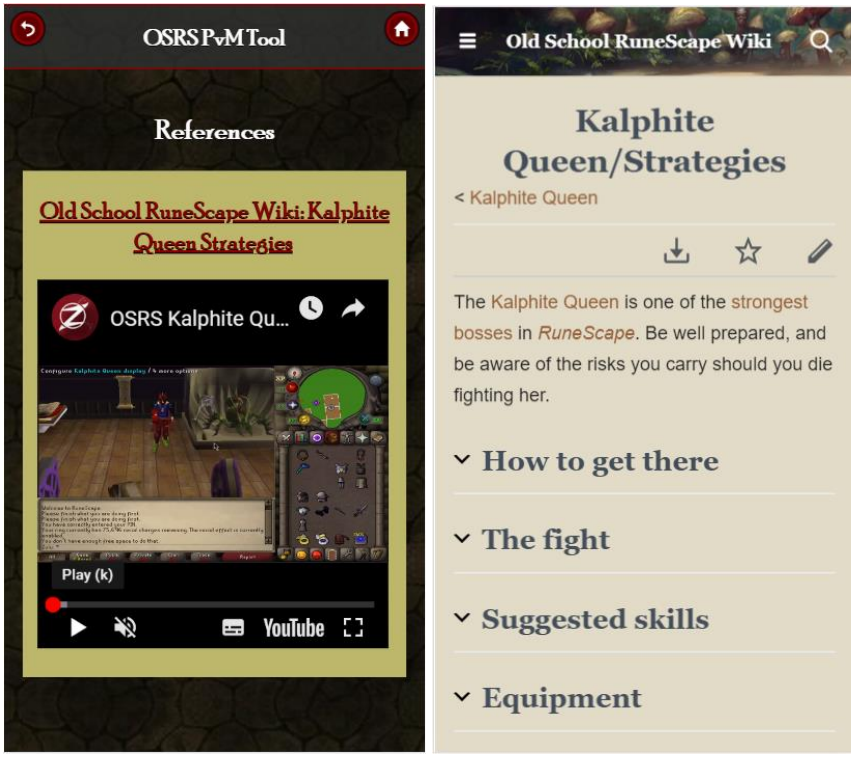


Figure 30. External Link Test (Text & Video)

The tests above in Figure 29. and Figure 30. the student using the button that takes the user to the main games website has a black line across it to incidate which one is being used in the test. The result is the user is taken to the correct website. The second test shows a hyperlink to the game's wiki website along with a youtube video playing. The playing video shows it works within the app and the link works to allow it to play. The hyperlink also correctly redirects the user to the wiki website.

6. Evaluation Phase

With the app and documentation completed on the planning and development of the project, the student must now reflect on the entire project and express their thoughts of how it went in terms of how they thought it would and if any changes arisen.

6.1. Changes

Several changes took place during development of the app which meant more researching and redoing areas. The first change that occurred was the homepage layout from the original designs since the student wanted it to feel more robust in relation to the rest of the app. This was because the interfaces on the homepage varied differently from the rest of the app and to maintain a more uniform approach, they decided to move the guides button from the header into the main body of the app. The student felt this was a good idea since with guides being the main purpose of the app, it made sense to promote them on the body of the screen.

This led to a few more navigational changes firstly including the external links since originally these were placed on the homepage although the student felt they dominated the screen and removed attention away from the RSS feed which would barely be visible on an initial load. The student felt the homepage would feel more central to app when users would be able to view the RSS news feed upon loading without as much scrolling. The external links were moved into a new page named extras which features alongside the guides button which maintains their importance.

Once this was done the user decided to remove the footer entirely from the app since there was now room on the navigation bar in the header to position the information area. The student switched the User Area button from the right side of the bar to the left and placing the information button where it once was. When doing this, they also decided to remove the text within the buttons to let the icons do the talking which makes it feel more like a mobile application and less like a website.

Another change to the project was how many guides are featured in it for grading as simply reproducing the same content with different text, images and references doesn't improve the student's potential grade. While there are six guide locations in the app as originally intended, only one guide is fully complete with the rest only having their loot tabs populated. This also links to the earlier designs showing achievement page which was changed from the achievements page to the loot page as it felt more relevant to the user killing the monsters for loot to take.

6.2. Issues

There were a few issues with the app that were not resolved in time for submission. The first of these issues is the functionality with live testing the authentication since the rules were disabled for development, the authentication had issues when enabled. Furthermore, the student has issues adapting error messages into a more mobile friendly format and while error appeared during testing in the browser, they weren't optimal for a mobile application. The student was also unable to find a way for the user to retrieve their uploaded files as the initial idea of providing a hyperlink for the user to save didn't work. Finally, the idea of linking user loot achievements to their account to save their selections was not implemented although users can still check off their loots without an account.

There were issues the student were unable to solve with the CSS styling also, the main issue was the loot tables displaying in a less than ideal or neat manner while in portrait mode. The student discovered this is due to the natural workings of the responsive tables for jQuery Mobile and was unable to resolve it in time. Therefore, the app user would benefit anyhow from using the feature in landscape mode.

Despite these disappointing issues, they are in some respect minor to the functionality of the app being a guidebook and the user account services have little purpose in the current state until further features were added to expand the scope of the app.

6.3. Critical Analysis

When I started this project, I had no idea on what to make that would meet the modules requirements and even now I'm not entirely sure if it meets the firebase requirements although it does support the feature. Planning this project was harder than I guessed it would be despite having an advantage in the topic the app is built around, there were a lot of factors I had to consider which all added up making it seem like a daunting task. I felt that the app would be suitable for a project because it is something that people would use if perfected and maintained plus it is something I would use myself which was a helpful motivator for me. I choose to do a mobile web app with HTML, CSS and JavaScript due to having the most experience in these languages compared to others and would make it easier to produce an app within the timeframe. Throughout the project I did learn some new features mostly regarding the jQuery Mobile features that I had not previous touched upon properly before which was a nice learning experience and gave me much more satisfaction with the product produced.

The software I was familiar with after working with WebStorm in past modules, so I found it a clear choice when considering a web application. Microsoft Word, Project and Visio were very helpful in producing the documentation, designs and diagrams required for this project and I would never have had managed to do so without them. Firebase was something I had touched on previously and while I didn't expect to use it again, it provided an opportunity to perhaps improve upon where I went wrong previously. While I found some aspects difficult and would spend many hours editing aspects such as CSS to make the app look nicer or to ensure something would fit on all screens or HTML divisions to see if collapsible tabs worked and learning to use containers to provide a secondary background, I found the project more and more enjoyable the more time I spent on it. I felt I managed this project decently well although I did feel stressed about the module being graded over weekly periods and not as a whole at the end like other project modules. My project schedule helped keep me on track mostly to ensure I did the best I could in the time I had.

In future I may return to improve this app and correct what was unable to be done for this module such as ensure users can view their uploads or add a database to manage the user accounts activity when it comes to uploading to avoid cluttering the file storage. It would also be good to expand the scope and add more features to the app for other aspects of the game which would bring more users and therefore more satisfied users that wish to enjoy the game more plus some income if marketed with advertisements. I feel I spent a lot of time on the styling of this app making custom images to act as buttons which took longer than I thought and now it still isn't perfect although I'm pleased with how the app looks and pleased with how it works.

7. References

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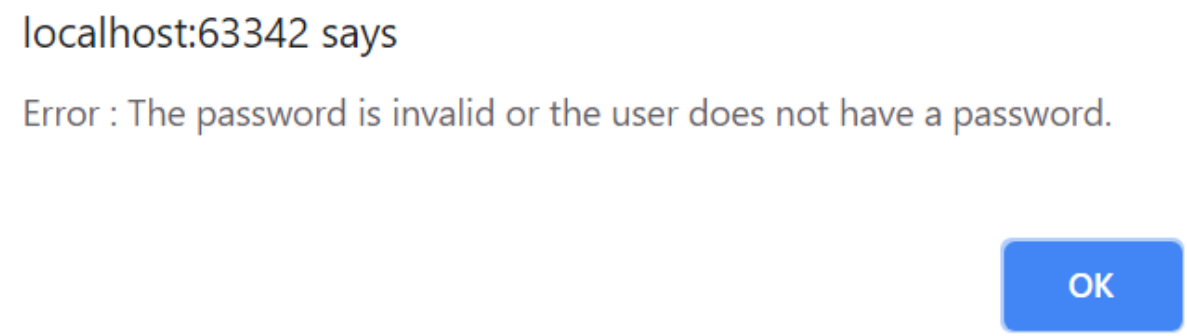
https://www.youtube.com/watch?v=LbhZCGas5RU&t=19s
[Date Accessed: 6th March 2019]

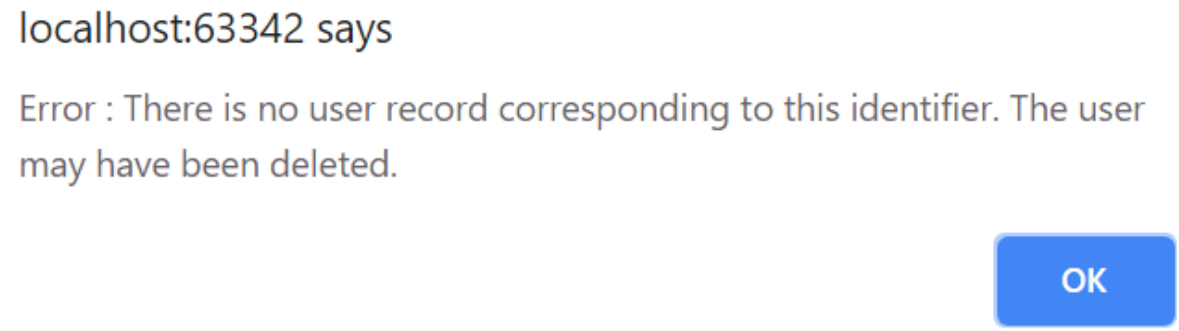
8. Appendices

Appendix 1. Portrait Loot Tables

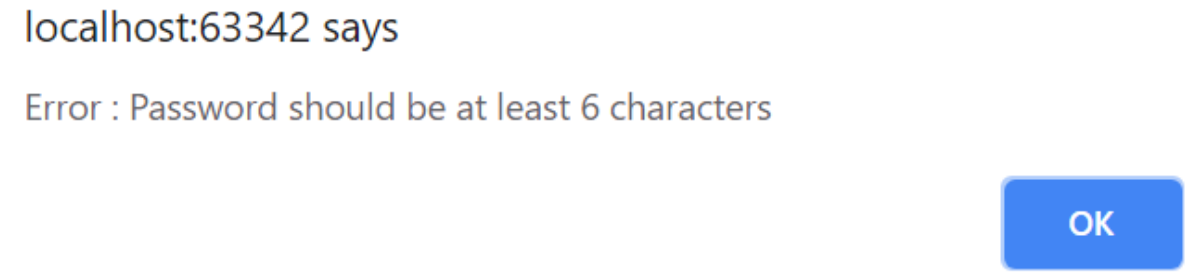
Appendix 2. Authentication Test – Incorrect Password



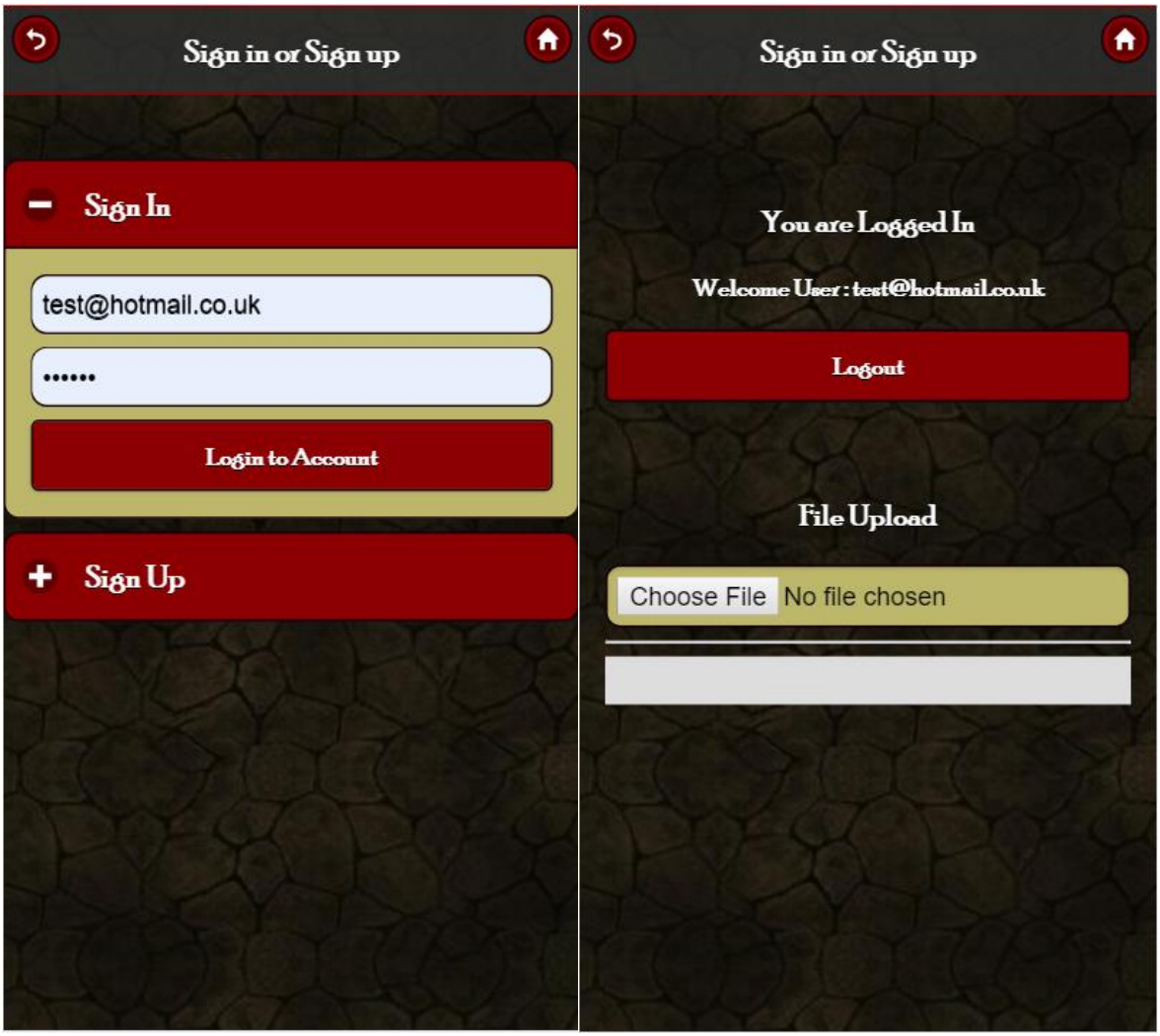
Appendix 3. Authentication Test – Non-Existing Account



Appendix 4. Authentication Test – Password Policy



Appendix 5. Upload Feature Unavailable Until Login



Appendix 6. HTML Project Code

```
<!DOCTYPE html>
<html lang="en">
<meta charset="UTF-8">
<title></title>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1" />
<link rel="stylesheet" href="http://code.jquery.com/mobile/1.4.5/jquery.mobile-
1.4.5.min.css" />
<link rel="stylesheet" type="text/css" href="css/rscompanionapp.css" />
<script src="https://www.gstatic.com/firebasejs/5.8.3/firebase.js"></script>
<script>
        // Initialize Firebase
        var config = {
            apiKey: "AIzaSyAaeq_V2dCykTZeVxI3puE9CveLrN2j3Og",
            authDomain: "runescape-companion-app.firebaseapp.com",
            databaseURL: "https://runescape-companion-app.firebaseio.com",
            projectId: "runescape-companion-app",
            storageBucket: "runescape-companion-app.appspot.com",
            messagingSenderId: "1018461035899"
        };
        firebase.initializeApp(config);
</script>
<script src="authentication.js"></script>
<script src="storage.js"></script>
<script src="js/jq/jquery-1.11.1.min.js"></script>
<script src="js/jq/jquery.mobile-1.4.5.min.js"></script>
</head>

<body>
<!-- HomePage -->
<div data-role="page" id="homepage">
    <div data-role="header">
        <h1>OSRS PvM Tool</h1>
        <a href="#userArea" data-icon="user" data-iconpos="notext"></a>
        <a href="#help" data-icon="info" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
      <img src="images/osrstitle.png">
        <br>
        <br>
        <a href="#guides"><img src="images/osrsguides.jpg"width=160 data-
role="button"></a>
        <a href="#extras"><img src="images/osrsextras.jpg"width=160 data-
role="button"></a>
        <br>
        <h2>Latest News</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
                <div id="rssincl-box-container-1210180"></div>
                    <script type="text/javascript">
                        (function() {
                        var s = document.createElement('script'); s.type =
'text/javascript'; s.async = true;
                        s.src =
'http://output30.rssinclude.com/output?type=asyncjs&id=1210180&hash=d04610f12d90a72
934b78103d2460b66';
                        document.getElementsByTagName('head')[0].appendChild(s);
                    })();
                </script>
                <br>
        </div>
    </div>
</div>
```

```
<!--PvM Guides Page-->
<div data-role="page" id="guides">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>PvM Guides</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#kalphiteQueen"><img src="images/kaphitequeen.jpg"width=160 data-
role="button"></a>
        <a href="#kingblackdragon"><img src="images/kingblackdragon1.jpg"width=160
data-role="button"></a>
        <a href="#chaosElemental"><img src="images/chaoselemental.jpg"width=160
data-role="button"></a>
        <a href="#dagannothKings"><img src="images/dagannothkings.jpg"width=160
data-role="button"></a>
        <a href="#giantMole"><img src="images/giantmole.jpg"width=160 data-
role="button"></a>
        <a href="#corporealBeast"><img src="images/corporealbeast.jpg"width=160
data-role="button"></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--Kalphite Queen Guide-->
<div data-role="page" id="kalphiteQueen">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>Kalphate Queen Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#kq1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#kq2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#kq3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#kq4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#kq5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#kq6" title="6. References"><img
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--KQ 1. Getting There-->
<div data-role="page" id="kq1">

    <div data-role="header">
```

```
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div data-role="collapsible">
            <h2>Getting There</h2>
            <p>The Kalphite Queen is located at the end of the Kalphite Lair in the
Kharidian Desert.
                <br>
                <br>
                From the surface area, players go west of the Shantay Pass until
they find a bulging tunnel; this is where a rope is needed for players. From the
dungeon area, walk south through the tunnel to reach the lair; another rope is
needed here.</p>
            <div align="center">
                <a href="#popupkqloc" data-rel="popup" data-position-to="window"
data-transition="fade"><img class="popphoto" src="images/kqlairloc.JPG" alt=""
style="width:30%"></a>
                <a href="#popupkqdirections" data-rel="popup" data-position-
to="window" data-transition="fade"><img class="popphoto" src="images/kqlairmap.jpg"
alt="" style="width:30%"></a>
                <div data-role="popup" id="popupkqloc" data-overlay-theme="b" data-
theme="b" data-corners="false">
                    <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-
shadow ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/kqlairloc.JPG" style="max-height:512px;" alt="">
                </div>
                <div data-role="popup" id="popupkqdirections" data-overlay-
theme="b" data-theme="b" data-corners="false">
                    <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-
shadow ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/kqlairmap.jpg" style="max-height:512px;" alt="">
                </div>
            </div>
        </div>
        <div data-role="collapsible">
            <h2>Extra Information</h2>
            <p>Once in the lair, players will go around a fairly large tunnel
section with hostile soldiers, which can poison if they damage you (Diary Shortcut
take you straight to the guardians).
                <br>
                <br>
                At the end is a chamber with two Kalphite guardians and another
bulging tunnel; this is where the other rope is used. Like the soldiers, the
guardians can poison, so being under the effects of an anti-poison potion is
recommended so the player does not get hit with poison while fighting the Queen.
                <br>
                <br>
                After going down, there is another set of guardians. On the other
side is the Queen; drink potions and put on protection prayers before charging
in.</p>
        </div>
    </div>
</div>

<!--KQ 2. The Fight-->
<div data-role="page" id="kq2">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div data-role="collapsible">
```

```
            <h2>Background</h2>
            <p>The Kalphite Queen, like most other bosses, has 255 Hitpoints.
                <br>
                <br>
                Her Magic and Ranged attacks have 100% accuracy, though it is
possible for the attack to deal no damage instead.
                <br>
                <br>
                Her Melee attack does not share this unique mechanic, and is
treated as a standard attack. Unlike the soldiers and guardians, this melee attack
does not poison.</p>
        </div>

        <div data-role="collapsible">
            <h2>Phases</h2>
            <p>There are two phases of the fight, similar to Vet'ion. While in her
grounded form, the Kalphite Queen has Protect from Magic and Protect from Missiles
active; however, they only add increased Defence to those styles rather than full
immunity like the player versions of it.
                <br>
                <br>
                When she falls to zero health in her first form, her chitin will
crack open and the second form, a wasp-like creature, will appear. This airborne
form has Protect from Melee active; however, like the first form, this only
provides increased Defence.
                <br>
                <br>
                Note: Upon triggering the second form, there is a time limit of 5
minutes for defeating it. If not defeated within this time frame, the Kalphite
Queen returns to the first form, though she carries the health she had left on her
second form when she reverted back.</p>
        </div>
    </div>
</div>

<!--KQ 3. Recommended Skills-->
<div data-role="page" id="kq3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div align="center">
        <h2>Suggested Skills</h2>
            <img src="images/pixel%20art/combat/kqskillreq.JPG">
        </div>
    </div>
</div>

<!--KQ 4. Equipment-->
<div data-role="page" id="kq4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div data-role="collapsible">
            <h2>Max Damage Per Second (DPS)</h2>
            <div align="center">
                <h2>First Phase</h2>
            </div>
            <p>During the first phase, Protect from Magic is recommended. Also,
```

```
Piety is strongly recommended to speed up kills. Conserve food by running
underneath her while healing rather than eating in the open, and use her minions or
walls to restrict her movement. Immediately run under her again after killing off
her first phase, heal up, and prepare for the second phase.</p>
            <div align="center">
                <h2>Second Phase</h2>
            </div>
            <p>During the second phase, it doesn't really matter whether you pray
Protect from Magic or Protect from Missiles, just make sure to stand in melee range
to reduce their frequency. It's recommended to walk under her as soon as this phase
begins, otherwise she will get an extra attack on you first. Also, Eagle Eye or
Rigour is strongly recommended to speed up kills. Conserve food by running
underneath her while healing rather than eating in the open, and use her minions or
walls to restrict her movement.</p>
            <div align="center">
                <h3>Recommended Gear & Inventory</h3>
            <a href="#popupmaxdpskqgear" data-rel="popup" data-position-to="window"
data-transition="fade"><img class="popphoto"
src="images/pixel%20art/combat/maxdpskqgear.JPG"  alt="" style="width:30%"></a>
            <a href="#popupmaxdpskqgear2" data-rel="popup" data-position-
to="window" data-transition="fade"><img class="popphoto"
src="images/pixel%20art/combat/maxdpskqgear2.JPG"  alt="" style="width:30%"></a>
            <a href="#popupmaxdpskqinvent" data-rel="popup" data-position-
to="window" data-transition="fade"><img class="popphoto"
src="images/pixel%20art/combat/maxdpskqinvent.JPG"  alt="" style="width:30%"></a>
            <div data-role="popup" id="popupmaxdpskqgear" data-overlay-theme="b"
data-theme="b" data-corners="false">
                <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-shadow
ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/pixel%20art/combat/maxdpskqgear.JPG" style="max-
height:512px;" alt="">
            </div>
            <div data-role="popup" id="popupmaxdpskqgear2" data-overlay-theme="b"
data-theme="b" data-corners="false">
                <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-shadow
ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/pixel%20art/combat/maxdpskqgear2.JPG" style="max-
height:512px;" alt="">
            </div>
            <div data-role="popup" id="popupmaxdpskqinvent" data-overlay-theme="b"
data-theme="b" data-corners="false">
                <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-shadow
ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/pixel%20art/combat/maxdpskqinvent.JPG" style="max-
height:512px;" alt="">
            </div>
            </div>

        </div>

        <div data-role="collapsible">
            <h2>Diary Method</h2>
            <div align="center">
                <h2>First Phase</h2>
            </div>
            <p>During the first phase, Protect from Magic is recommended. Also,
Piety is strongly recommended to speed up kills. Conserve food by running
underneath her while healing rather than eating in the open, and use her minions or
walls to restrict her movement. Immediately run under her again after killing off
her first phase, heal up, and prepare for the second phase.</p>
            <div align="center">
                <h2>Second Phase</h2>
            </div>
            <p>During the second phase, it doesn't really matter whether you pray
Protect from Magic or Protect from Missiles, just make sure to stand in melee range
to reduce their frequency. It's recommended to walk under her as soon as this phase
begins, otherwise she will get an extra attack on you first. Also, Eagle Eye or
Rigour is strongly recommended to speed up kills. Conserve food by running
```

```
underneath her while healing rather than eating in the open, and use her minions or
walls to restrict her movement.</p>
            <div align="center">
                <h3>Recommended Gear</h3>
                <a href="#popupdiarykqgear" data-rel="popup" data-position-
to="window" data-transition="fade"><img class="popphoto"
src="images/pixel%20art/combat/diarykqgear.JPG"  alt="" style="width:30%"></a>
                <a href="#popupdiarykqinvent" data-rel="popup" data-position-
to="window" data-transition="fade"><img class="popphoto"
src="images/pixel%20art/combat/diarykqinvent.JPG"  alt="" style="width:30%"></a>
                <div data-role="popup" id="popupdiarykqgear" data-overlay-theme="b"
data-theme="b" data-corners="false">
                    <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-
shadow ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/pixel%20art/combat/diarykqgear.JPG" style="max-
height:512px;" alt="">
                </div>
                <div data-role="popup" id="popupdiarykqinvent" data-overlay-
theme="b" data-theme="b" data-corners="false">
                    <a href="#" data-rel="back" class="ui-btn ui-corner-all ui-
shadow ui-btn-a ui-icon-delete ui-btn-icon-notext ui-btn-right">Close</a><img
class="popphoto" src="images/pixel%20art/combat/diarykqinvent.JPG" style="max-
height:512px;" alt="">
                </div>
            </div>
        </div>
    </div>
</div>

<!--KQ 5. Loot-->
<div data-role="page" id="kq5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Dragon Chainbody</td>
                <td><img
src="images/pixel%20art/kalphite%20queen/Dragon%20chainbody.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Dragon 2H Sword</td>
                <td><img
src="images/pixel%20art/kalphite%20queen/Dragon%202h%20sword.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Jar of Sand</td>
                <td><img
src="images/pixel%20art/kalphite%20queen/Jar%20of%20sand.png"></td>
```

```
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Kq Head</td>
                <td><img
src="images/pixel%20art/kalphite%20queen/Kq%20head.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Kalphite Princess</td>
                <td><img
src="images/pixel%20art/kalphite%20queen/Kalphite%20princess.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            </tbody>
        </table>
    </div>
</div>

<!--KQ 6. References-->
<div data-role="page" id="kq6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div align="center">
            <h2>References</h2>
            <div data-role="container" align="center" style="background-color:
darkkhaki">
                <br>
            <a
href="https://oldschool.runescape.wiki/w/Kalphite_Queen/Strategies">Old School
RuneScape Wiki: Kalphite Queen Strategies</a>
            <br>
            <br>
            <iframe width="300" height="315"
src="https://www.youtube.com/embed/LbhZCGas5RU" frameborder="0"
allow="accelerometer; autoplay; encrypted-media; gyroscope; picture-in-picture"
allowfullscreen></iframe>
                <br>
                <br>
            </div>
        </div>
    </div>
</div>



<!--King Black Dragon Guide-->
<div data-role="page" id="kingblackdragon">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
```

```
        <h2>King Black Dragon Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#kbd1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#kbd2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#kbd3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#kbd4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#kbd5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#kbd6" title="6. References"><img
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--KBD 1. Getting There-->
<div data-role="page" id="kbd1">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--KBD 2. The Fight-->
<div data-role="page" id="kbd2">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--KBD 3. Recommended Skills-->
<div data-role="page" id="kbd3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--KBD 4. Equipment-->
<div data-role="page" id="kbd4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
```

```
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--KBD 5. Loot-->
<div data-role="page" id="kbd5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Dragon Med Helm</td>
                <td><img src="images/pixel art/king black
dragon/Dragon%20med%20helm.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Dragon Pickaxe</td>
                <td><img
src="images/pixel%20art/king%20black%20dragon/Dragon%20pickaxe.png"></tr>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Draconic Visage</td>
                <td><img src="images/pixel art/king black dragon/Draconic
visage.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Kbd Heads</td>
                <td><img src="images/pixel art/king black dragon/Kbd
heads.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Prince Black Dragon</td>
                <td><img src="images/pixel art/king black dragon/Prince black
dragon.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
```

```
            </tbody>
        </table>
    </div>
</div>

<!--KBD 6. References-->
<div data-role="page" id="kbd6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>



<!--Chaos Elemental Guide-->
<div data-role="page" id="chaosElemental">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>Chaos Elemental Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#ce1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#ce2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#ce3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#ce4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#ce5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#ce6" title="6. References"><img
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--CE 1. Getting There-->
<div data-role="page" id="ce1">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CE 2. The Fight-->
<div data-role="page" id="ce2">
```

```
    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CE 3. Recommended Skills-->
<div data-role="page" id="ce3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CE 4. Equipment-->
<div data-role="page" id="ce4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CE 5. Loot-->
<div data-role="page" id="ce5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Dragon Dagger</td>
                <td><img src="images/pixel art/chaos elemental/Dragon
dagger.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
```

```
                <td>Dragon 2H Sword</td>
                <td><img src="images/pixel art/kalphite queen/Dragon 2h
sword.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Dragon Pickaxe</td>
                <td><img src="images/pixel art/king black dragon/Dragon
pickaxe.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Pet Chaos Elemental</td>
                <td><img src="images/pixel art/chaos elemental/Pet chaos
elemental.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            </tbody>
        </table>
    </div>
</div>

<!--CE 6. References-->
<div data-role="page" id="ce6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>



<!--King Dagannoths Guide-->
<div data-role="page" id="dagannothKings">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>King Dagannoths Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#dks1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#dks2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#dks3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#dks4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#dks5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#dks6" title="6. References"><img
```

```
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--DKS 1. Getting There-->
<div data-role="page" id="dks1">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--DKS 2. The Fight-->
<div data-role="page" id="dks2">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--DKS 3. Recommended Skills-->
<div data-role="page" id="dks3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--DKS 4. Equipment-->
<div data-role="page" id="dks4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--DKS 5. Loot-->
<div data-role="page" id="dks5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
```

```
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Seercull</td>
                <td><img src="images/pixel art/dagannoth kings/Seercull.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Archer Ring</td>
                <td><img src="images/pixel art/dagannoth kings/Archers
ring.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Pet Dagannoth Supreme</td>
                <td><img src="images/pixel art/dagannoth kings/Pet dagannoth
supreme.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Mud Battlestaff</td>
                <td><img src="images/pixel art/dagannoth kings/Mud
battlestaff.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Seers Ring</td>
                <td><img src="images/pixel art/dagannoth kings/Seers
ring.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Pet Dagannoth Prime</td>
                <td><img src="images/pixel art/dagannoth kings/Pet dagannoth
prime.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Warrior Ring</td>
                <td><img src="images/pixel art/dagannoth kings/Warrior
ring.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
```

```
            </tr>
            <tr>
                <td>Berserker Ring</td>
                <td><img src="images/pixel art/dagannoth kings/Berserker
ring.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Pet Dagannoth Rex</td>
                <td><img src="images/pixel art/dagannoth kings/Pet dagannoth
rex.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            </tbody>
        </table>
    </div>
</div>

<!--DKS 6. References-->
<div data-role="page" id="dks6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>



<!--Giant Mole Guide-->
<div data-role="page" id="giantMole">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>Giant Mole Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
        <a href="#gm1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#gm2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#gm3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#gm4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#gm5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#gm6" title="6. References"><img
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>
```

```
<!--GM 1. Getting There-->
<div data-role="page" id="gm1">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <li>
        <li> The Kalphite Queen is located at the end of the Kalphite Lair in the
Desert.</li>
        <li> The Lair can be reached by going west from Shanty Pass.</li>
        <li> The player will need a rope to enter the hole</li>
        <br>
        <div align="center">
            <p>A map of the lair.</p>
            <img src="images/kqlairmap.jpg"width=160>
        </div><br>
        Once in the lair, players will go around a fairly large tunnel section with
hostile soldiers, which can poison if they damage you. At the end is a chamber with
two Kalphite guardians and another bulging tunnel; this is where the other rope is
used. Like the soldiers, the guardians can poison, so being under the effects of an
anti-poison potion is recommended so the player does not get hit with poison while
fighting the Queen.

        After going down, there is another set of guardians. On the other side is
the Queen; drink potions and put on protection prayers before charging in.</p>
    </div>
</div>

<!--GM 2. The Fight-->
<div data-role="page" id="gm2">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--GM 3. Recommended Skills-->
<div data-role="page" id="gm3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--GM 4. Equipment-->
<div data-role="page" id="gm4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
```

```
    </div>

    <div data-role="content">

    </div>
</div>

<!--GM 5. Loot-->
<div data-role="page" id="gm5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Baby Mole</td>
                <td><img src="images/pixel art/giant mole/Baby mole.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            </tbody>
        </table>
    </div>
</div>

<!--GM 6. References-->
<div data-role="page" id="gm6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>



<!--Corporeal Beast Guide-->
<div data-role="page" id="corporealBeast">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content" align="center">
        <h2>Corporeal Beast Guide</h2>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <br>
```

```
        <a href="#cb1" title="1. Getting There"><img
src="images/step1.jpg"width=160></a>
        <a href="#cb2" title="2. The Fight"><img
src="images/step2.jpg"width=160></a>
        <a href="#cb3" title="3. Recommended Skills"><img
src="images/step3.jpg"width=160></a>
        <a href="#cb4" title="4. Equipment"><img
src="images/step4.jpg"width=160></a>
        <a href="#cb5" title="5. Loot"><img src="images/step5.jpg"width=160></a>
        <a href="#cb6" title="6. References"><img
src="images/step6.jpg"width=160></a>
            <br>
            <br>
        </div>
    </div>
</div>

<!--CB 1. Getting There-->
<div data-role="page" id="cb1">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CB 2. The Fight-->
<div data-role="page" id="cb2">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CB 3. Recommended Skills-->
<div data-role="page" id="cb3">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>

<!--CB 4. Equipment-->
<div data-role="page" id="cb4">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>
```

```
    <div data-role="content">

    </div>
</div>

<!--CB 5. Loot-->
<div data-role="page" id="cb5">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <table data-role="table" class="ui-responsive">
            <thead>
            <tr>
                <th>Item Name</th>
                <th>Item Image</th>
                <th>Obtained?</th>
            </tr>
            </thead>
            <tbody>
            <tr>
                <td>Spirit Shield</td>
                <td><img src="images/pixel art/corporeal beast/Spirit
shield.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Holy Elixir</td>
                <td><img src="images/pixel art/corporeal beast/Holy
elixir.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Spectral Sigil</td>
                <td><img src="images/pixel art/corporeal beast/Spectral
sigil.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Arcane Sigil</td>
                <td><img src="images/pixel art/corporeal beast/Arcane
sigil.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Elysian Sigil</td>
                <td><img src="images/pixel art/corporeal beast/Elysian
sigil.png"></td>
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            <tr>
                <td>Pet Dark Core</td>
                <td><img src="images/pixel art/corporeal beast/Pet dark
core.png"></td>
```

```
                <td>
                    <input type="checkbox" name="checkbox-0" data-mini="true">
                </td>
            </tr>
            </tbody>
        </table>
    </div>
</div>

<!--CB 6. References-->
<div data-role="page" id="cb6">

    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">

    </div>
</div>




<!--Sign In/Sign Up Page-->
<div data-role="page" id="userArea">
    <div data-role="header">
        <h1>Sign in or Sign up</h1>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
    </div>

    <div data-role="collapsible" id="login_div" class="main-div">
        <h3>Sign In</h3>
        <input type="email" placeholder="Email..." id="email_field" />
        <input type="password" placeholder="Password..." id="password_field" />

        <button onclick="login()">Login to Account</button>
    </div>

    <div data-role="content" align="center" id="user_div" class="loggedin-div">
        <h3>You are Logged In</h3>
        <p id="user_para">You're currently logged in. Click here to Logout.</p>
        <button onclick="logout()">Logout</button>
    </div>

    <div data-role="collapsible" id="new_div" class="newloggedin-div">
        <h5>Sign Up</h5>
        <input type="email" placeholder="Email..." id="newemail_field" />
        <input type="password" placeholder="Password..." id="newpassword_field" />

        <button onclick="signUp()">Create Account</button>
    </div>

    <div data-role="content" id="uploaddiv" align="center">
        <h3>File Upload</h3>
        <input type="file" class="upload" id="upload_file" size="50" name="icon"
onchange="loadFile(this);" >
            <hr>
            <div id="myProgress">
                <div id="myBar"></div>
            </div>
    </div>
```

```
</div>

<!--Help Page-->
<div data-role="page" id="help">
    <div data-role="header">
        <h2>Help Page</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>

    <div data-role="content">
        <div data-role="collapsible">
            <h5>About</h5>
            <p>This app was developed by Paul Walker for their Advanced Programming
for Mobile Devices Module while attending The University of the West of Scotland.
                <br>
                <br>
                This app is designed as a companion styled guide for killing
specific monsters on Old School RuneScape.</p>
        </div>

        <div data-role="collapsible">
            <h5>How was it made?</h5>
            <p>The app was made using HTML5, CSS, JavaScript, jQuery and jQuery
Mobile plus resources including JetBrains's WebStorm and Google's Firebase.</p>
        </div>

        <div data-role="collapsible">
            <h5>Navigation</h5>
            <p>To navigate around this application, use the buttons in the header
or footer of the page.
                <br>
                <br>
                Users can also click image buttons within the app to navigate to
specific areas. To return to the homepage, please select the home button in the
header of the page.</p>
        </div>
        <div data-role="collapsible">
            <h5>Hyperlinks</h5>
            <p>This application uses external sources, some hyperlinks may be vague
such as image hyperlinks, to use them simply select the image
                and you will be redirected to the linked location.</p>
        </div>
        <div data-role="collapsible">
            <h5>User Accounts</h5>
            <p>Some features within this application require an account to use.
                <br>
                <br>
                To create an account, select the User button on the top left corner
of the homepage. Here you have the option to sign in if you already have an account
or you may register one.
                <br>
                <br>
                User accounts require an email and password to be created, once
entered select the button below to create your account and sign in.
                To logout, select the logout button.</p>
        </div>
    </div>
</div>

<!--Extras Page-->
<div data-role="page" id="extras">
    <div data-role="header">
        <h2>OSRS PvM Tool</h2>
        <a href="#" data-rel="back" data-icon="back" data-iconpos="notext"></a>
        <a href="#homepage" data-icon="home" data-iconpos="notext"></a>
    </div>
```

```
    <div data-role="content">
        <div align="center">
        <h2>Extra Links</h2>
        </div>
        <div data-role="container" align="center" style="background-color:
darkkhaki">
            <div style="color:black">
                <div style="font-family: 'Times New Roman';">
            <p>Use these services if you wish to learn more information about
killing any monsters or the game itself.</p>
            <a href="https://www.reddit.com/r/2007scape/"><img
src="images/osrsreddit.jpg" width="160"></a>
            <a href="https://oldschool.runescape.wiki/"><img
src="images/osrswiki.jpg" width="160"></a>
            <a href="https://oldschool.tools/"><img src="images/osrstools.jpg"
width="160"></a>
            <a href="https://oldschool.runescape.com/"><img
src="images/osrswebsite.jpg" width="160"></a>
                </div>
            </div>
        </div>
    </div>
</div>

</body>
</html>
```

Appendix 7. Project CSS Code

```
#homepage .ui-controlgroup{
    width: 70%;
    margin: 0 auto;
    margin-top: 20px;
    max-width: 500px;
}

#errorText{
    color: red;
    font: bold 20px arial;
}

.ui-icon-search:after{
    width: 41px ;
    height: 41px ;
    top: 25%;
    left: 25%;
}

.ui-icon-star:after{
    width: 41px ;
    height: 41px ;
    top: 25%;
    left: 25%;
}

table{
    font-family: "poor richard";
    width: 100%;
    border-collapse: collapse;
}

table td, th{
    font-size: 1.3em;
    border: 1px solid #ffffff;
    padding: 3px 7px 2px 7px;
}

table th{
    font-size: 1.1em;
    text-align: left;
    padding-top: 5px;
    padding-bottom: 4px;
    margin-bottom: 7px !important;
    background-color: rgba(47,48,47,0.79);
    color: #ffffff;
}

table tr{
    color: white;
    background-color: slategray;
    font-family: "poor richard";
    border: 2px solid darkred;
    padding: 10px 40px;
    background: gray;
    border-radius: 25px;
}


li.selected{
    background-color: #1baeff;
    border-radius: inherit;
}

#footer{
    background-color: #0b1572 !important;
```

```
}


#myPanel{
    background-color: khaki;

}

#myCanvas{
    background-color: khaki;
    color: darkred;
}



/* Buttons*/
.ui-btn,
label.ui-btn {
    font-weight: bold;
    border-width: 1px;
    border-style: solid;
    font-family: "poor richard";
}

.ui-btn {
    text-decoration: none !important;
}

.ui-btn-active {
    cursor: pointer;
}

.ui-corner-all {
    -webkit-border-radius: .6em;
    border-radius: .6em;
}

.ui-btn-corner-all,
.ui-btn.ui-corner-all,
.ui-slider-track.ui-corner-all,
.ui-flipswitch.ui-corner-all,

.ui-li-count {
    -webkit-border-radius: .3125em;
    border-radius: .3125em;
}


.ui-btn-icon-notext.ui-btn-corner-all,
.ui-btn-icon-notext.ui-corner-all {
    -webkit-border-radius: 1em;
    border-radius: 1em;
}

.ui-btn-corner-all,
.ui-corner-all {
    -webkit-background-clip: padding;
    background-clip: padding-box;
}

.ui-popup.ui-corner-all > .ui-popup-arrow-guide {
    left: .6em;
    right: .6em;
    top: .6em;
    bottom: .6em;
}

.ui-page-theme-a .ui-btn,
```

```
html .ui-bar-a .ui-btn,
html .ui-body-a .ui-btn,
html body .ui-group-theme-a .ui-btn,
html head + body .ui-btn.ui-btn-a,


.ui-page-theme-a .ui-btn:visited,
html .ui-bar-a .ui-btn:visited,
html .ui-body-a .ui-btn:visited,
html body .ui-group-theme-a .ui-btn:visited,
html head + body .ui-btn.ui-btn-a.ui-btn:visited {
    background-color: darkred;
    border-color: #1a000d;
    color: #ffffff;
    text-shadow: 0 1px 0 #000000;
}


.ui-page-theme-a .ui-btn:hover,
html .ui-bar-a .ui-btn:hover,
html .ui-body-a .ui-btn:hover,
html body .ui-group-theme-a .ui-btn:hover,
html head + body .ui-btn.ui-btn-a:hover{
    background-color: darkred;
    border-color: #1a000d;
    color: #ffffff;
    text-shadow: 0 1px 0 #000000;
}


.ui-page-theme-a .ui-btn:active,
html .ui-bar-a .ui-btn:active,
html .ui-body-a .ui-btn:active,
html body .ui-group-theme-a .ui-btn:active,
html head + body .ui-btn .ui-btn-a:active  {
    background-color: indianred;
    border-color: white;
    color: #000000;
    text-shadow: 0 1px 0 #ffffff;
}




/* HEADER */
.ui-bar-a,
.ui-page-theme-a .ui-bar-inherit,
html .ui-bar-a .ui-bar-inherit,
html .ui-body-a .ui-bar-inherit,
html body .ui-group-theme-a .ui-bar-inherit {
    background-color: rgba(47,48,47,0.79);
    border-color: darkred;
    color: #ffffff;
    text-shadow: 0 1px 0 #000000;
    font-weight: bold;
    font-size: 20px;
    font-family: "poor richard";
}

.ui-bar-a {
    border-width: 1px;
    border-style: solid;
}
```

```
/* MAIN PAGE */
/* Navigation Menu */
.ui-overlay-a,
.ui-page-theme-a,
.ui-page-theme-a,
.ui-panel-wrapper {
    background-image: url("../images/osrsbackground.jpg");
    background-size: 100%;
    background-color: darkslategray;
    border-color: yellow;
    color: white;
    font-family: "poor richard";
    font-weight: bold;
    text-shadow: 0 1px 0 #000000;
}

.ui-body-a,
.ui-page-theme-a .ui-body-inherit,
html .ui-bar-a .ui-body-inherit,
html .ui-body-a .ui-body-inherit,
html body .ui-group-theme-a .ui-body-inherit,
html .ui-panel-page-container-a {
    background-color: darkkhaki;
    border-color: #1a000d;
    color: black;
    font-family: "Arial";
    font-weight: normal;
    text-shadow: 0 1px 0 #000000;
}

.ui-body-a {
    border-width: 1px;
    border-style: solid;
}




/* Button Scenarios */
.ui-page-theme-a a,
html .ui-bar-a a,
html .ui-body-a a,
html body .ui-group-theme-a a{
    color: darkred;
    font-family: "poor richard";
    font-size: 20px;
}

.ui-page-theme-a a:visited,
html .ui-bar-a a:visited,
html .ui-body-a a:visited,
html body .ui-group-theme-a a:visited{
    color: darkred;
    font-family: "poor richard";
}

.ui-page-theme-a a:hover,
html .ui-bar-a a:hover,
html .ui-body-a a:hover,
html body .ui-group-theme-a a:hover{
    color: indianred;
    font-family: "poor richard";
}

.ui-page-theme-a a:active,
html .ui-bar-a a:active,
html .ui-body-a a:active,
```

```css
html body .ui-group-theme-a a:active{
    color: indianred;
    font-family: "poor richard";
}

body{
    background:#e6e6e6;
}
.main
{
    background:none;
    width:30%;
    padding:60px;
}
#myProgress {
    width: 100%;
    background-color: #ddd;
    text-align: center;
}
#myBar {
    width: 0%;
    height: 30px;
    background-color: #4CAF50;
    text-align: center;
    line-height: 30px;
    color: white;
}

.rss {
    position: absolute;

}
.content {
    text-decoration-color: darkgoldenrod;
    position: absolute;

}
.contentbox {
    background-color: darkkhaki;
    font-family: "Times New Roman";
}
```

Appendix 8. Project JavaScript Authentication Code

```
firebase.auth().onAuthStateChanged(function(user) {
    if (user) {
        // User is signed in.

        document.getElementById("user_div").style.display = "block";
        document.getElementById("login_div").style.display = "none";
        document.getElementById("uploaddiv").style.display = "block";
        document.getElementById("new_div").style.display = "none";

        var user = firebase.auth().currentUser;

        if(user != null){

            var email_id = user.email;
            document.getElementById("user_para").innerHTML = "Welcome User : " +
email_id;

        }

    } else {
        // No user is signed in.

        document.getElementById("user_div").style.display = "none";
        document.getElementById("login_div").style.display = "block";
        document.getElementById("uploaddiv").style.display = "none";
        document.getElementById("new_div").style.display = "block";
            }
    });
function login(){

    var userEmail = document.getElementById("email_field").value;
    var userPass = document.getElementById("password_field").value;

    firebase.auth().signInWithEmailAndPassword(userEmail,
userPass).catch(function(error) {
        // Handle Errors here.
        var errorCode = error.code;
        var errorMessage = error.message;

        window.alert("Error : " + errorMessage);

        // ...
    });

}

function signUp(){

    var userEmail = document.getElementById("newemail_field").value;
    var userPass = document.getElementById("newpassword_field").value;

    firebase.auth().createUserWithEmailAndPassword(userEmail,
userPass).catch(function(error) {
        // Handle Errors here.
        var errorCode = error.code;
        var errorMessage = error.message;

        window.alert("Error : " + errorMessage);

            // ...
        });

    }
function logout(){
    firebase.auth().signOut();
}
```

Appendix 8. Project JavaScript File Storage Code

```
function loadFile(input) {

    //Defining element to show the progress
    var elem = document.getElementById("myBar");
    var filetoUpload=input.files[0];

    //Initializing the reference of database with the filename
    var storageRef = firebase.storage().ref(filetoUpload.name);

    //Uploading file
    var task = storageRef.put(filetoUpload);
    task.on('state_changed',
        function progress(snapshot){
            var percentage = snapshot.bytesTransferred / snapshot.totalBytes * 100;
            //uploader.value = percentage;
            elem.style.width = parseInt(percentage) + '%';
            elem.innerHTML=parseInt(percentage)+'%';
        },
        function error(err){

        },
        function complete(){
            var downloadURL = task.snapshot.downloadURL;
        }
    );
}
```