Project Thor

Design Document

Version 1.0

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Table of Contents

1. Introduction

This Design Document is a document to provide documentation which will be used to aid in the project development. Within are narrative and graphical representations of the designs for the project including UML diagrams, use case diagrams, database designs, website page wireframes, and system architecture. …..

1.1. Purpose

Project Thor's main goal is to provide a simple method that uses data gathered from natural phenomena (in our case lightning) to produce more random numbers to be used as seeds for encryption key algorithms. Keeping in line with that goal, the purpose of this design document is to provide a description of the design of our project fully enough to allow for the development to proceed while giving those involved in the project an understanding of what is to be produced and how it is expected to be produced. This document is intended to be used alongside the Requirements Document and reflect the specifications described therein.

1.2. Scope

As stated in the purpose section, this document is provided simply to provide a description of the design of the project. This description is limited to the project deliverables specified in the requirements document: web application, database, and data transfer automation. All other designs relating to tools, research, repositories, file management systems, etc. shall be considered outside the scope of this document and will be left to the team members to construct or source on an adjunct basis.

1.3. Document Conventions

Text Here

1.4. Intended Audience

The intended audience for this document are the team members and developers of this project who are directly involved in the development of the project deliverables. However, this document may also be used by the faculty advisor and others who are involved in the project in a review capacity in order to gain an understanding of what will be developed and delivered to the client as well as how it will be developed.

1.5. References

This document makes some references to external resources not defined or specified herein. Therefore, for ease of reference they have been listed and linked below.

- Project Thor: Requirements Document
- Database Design: https://dbdiagram.io/d/6151f446825b5b0146157100

2. System Design

This section of the document discusses the design aspects of our project's system from a high level perspective. In the sections below, developers will be given an idea of the different components of our system along with how they will be expected to interact with each other to achieve our project's goal. Additionally, we have specified the design of some of the processes users will be expected to use in order to interact with our system.

2.1. Overview

The purpose of our system is to demonstrate our project's goal, which is to implement a high entropy data set created by natural phenomena into the process to generate encryption keys as referenced in the solution section of our Requirements Document. In doing so, the Project Thor team has designed a system that incorporates a database containing the data set, scripts that transfer new data into the database, and a web application that educates users about the project and shows them a working example. Each of these system components accomplishes a certain task towards that goal and the critical design aspects of each are described throughout the remainder of this document.

2.2. System Architecture

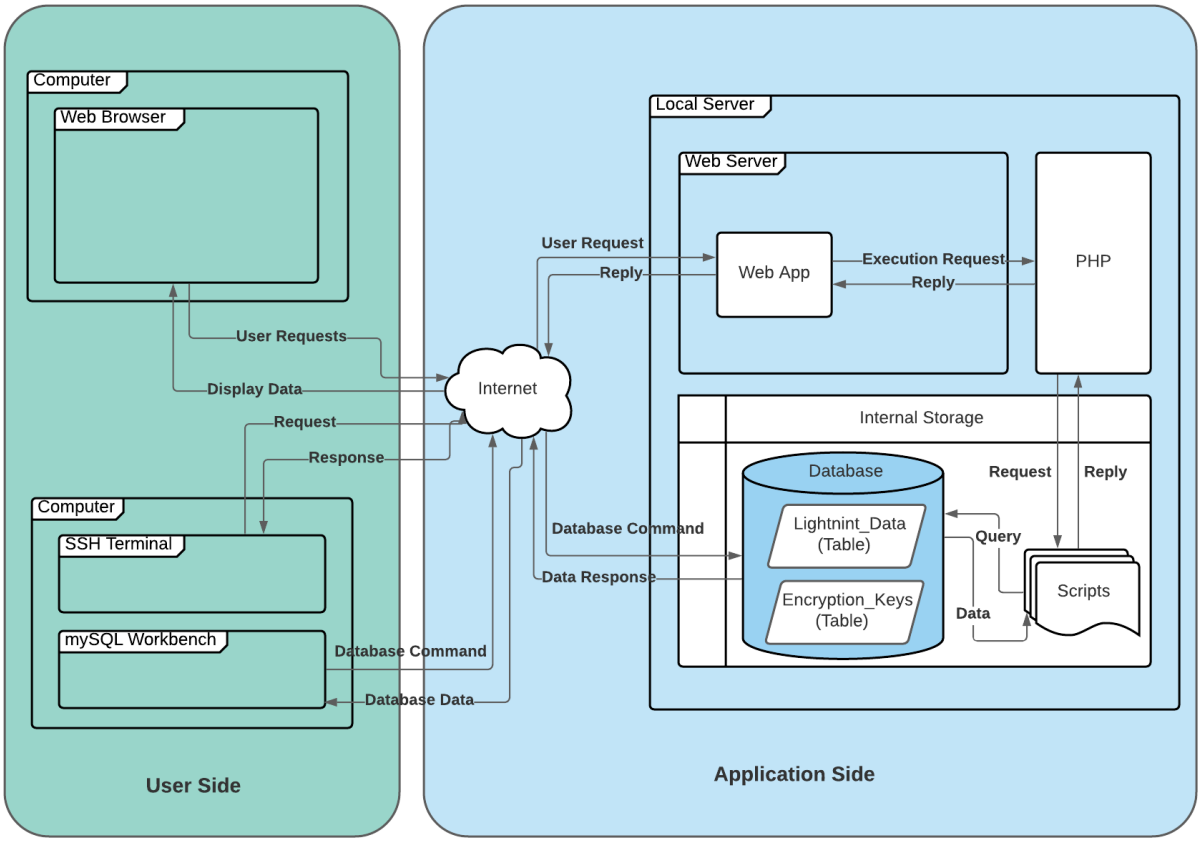


Figure 1: System Architecture Diagram

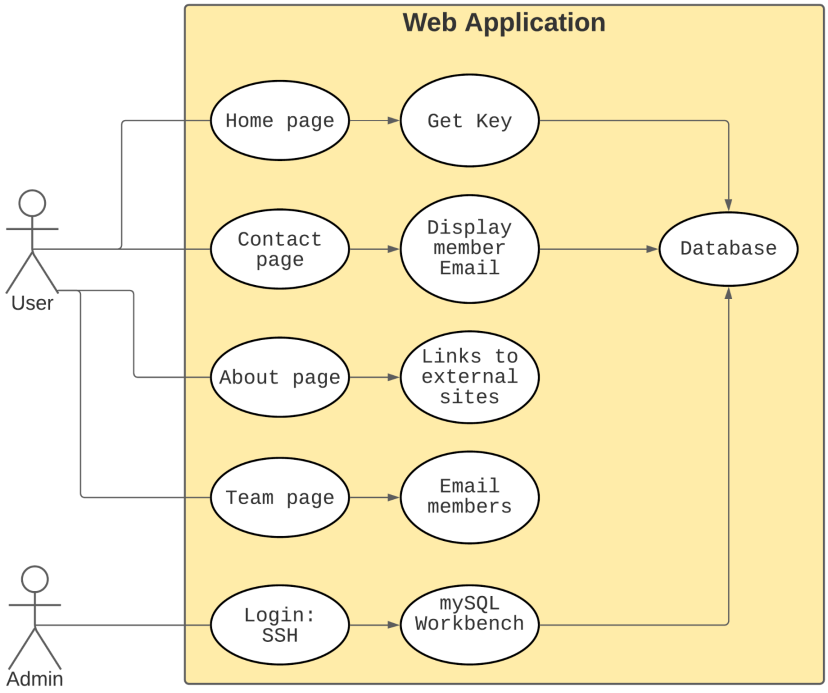
The system's layout and interactions are fairly simple as can be seen in figure one. It is broken down into two main areas: the user side and the application side. On the user side, there is very little design to be done, but it's more important to understand the interactions taking place so that the application sides can be designed to accommodate them. For example, per requirements WEB-4 and WEB-5 the web application needs to be accessible on certain operating systems and web browsers. Therefore, we have decided that's how the users shall interact with the web application while on the other hand, the project team shall interface with the web application through any ssh terminal and the database specifically through mySQL Workbench.On the application side, we have many more system design tasks.

Beginning with the database, the team must design two different tables to be stored there. More details on the specifics of those tables can be found in a later section of this document. However, the management of those tables will be handled in part by the team (via mySQL Workbench) and by two python scripts. The first script will be tasked with the automated transfer of the data from an ASCII text file into the first table of the database. It will only transfer the specific lightning parameters needed for the project and will also examine and sort out bad data (the qualifications for "bad" data

shall be determined by the team at a later time). The second script will pull data from the first table, combine it into one seed value, run that value through an encryption key algorithm, and then store the new key within the second table of the database.

In regards to the web server, the team will have to design a web application using php. The specific UI designs of the application are detailed within the Web Application Interface section of this document

2.3. Use Cases



2.3.1.

2.3.2. Administrator

2.3.2.1. Function 1

2.3.3. User

2.3.3.1. The user will have 2 main use cases. The first is the home page, and the second is on the contact page. The first user use case would be navigating to the home page and generating a

2.3.3.2. The user 2

2.4. Methods

2.4.1. generateKey()

The generateKey function will be called when the user clicks the Generate Key button on the Key Generation page of the website. The method will return an encryption key to the user.

2.4.2. submitForm()

This method would be called on the contact form page. The method will connect with the php server to send an email containing the user's message.

Input: User filled text areas in contact form

Output: email sent to 4 team members

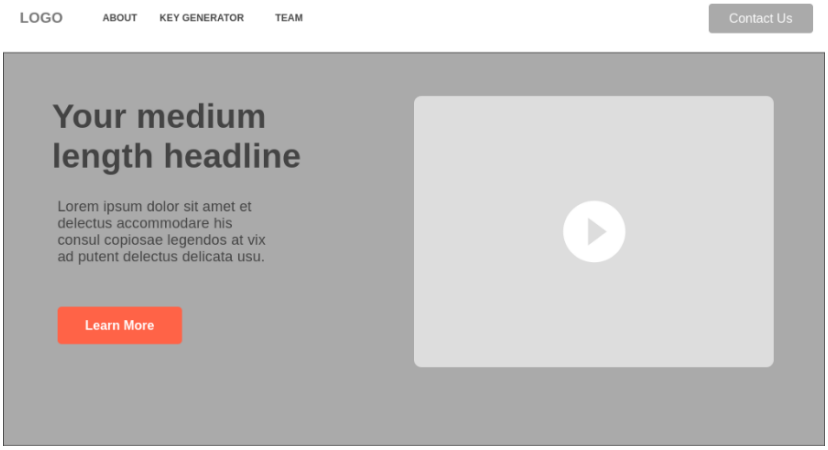
3. User Interface

3.1. Overview

3.2. Page Layouts

3.2.1. About Page

3.2.1.1. Section 1: Section Title



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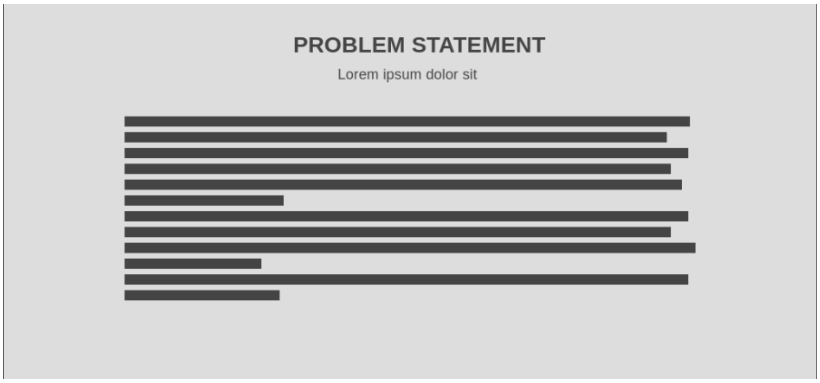
3.2.1.2. Section Two: Title



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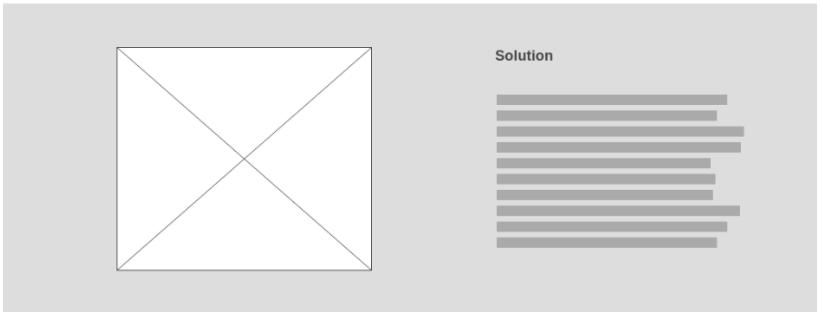
3.2.1.3.



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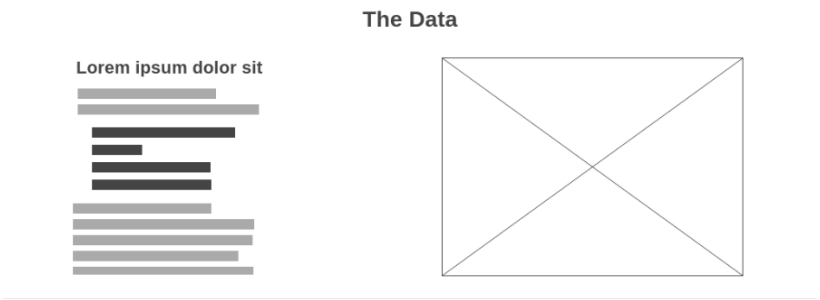

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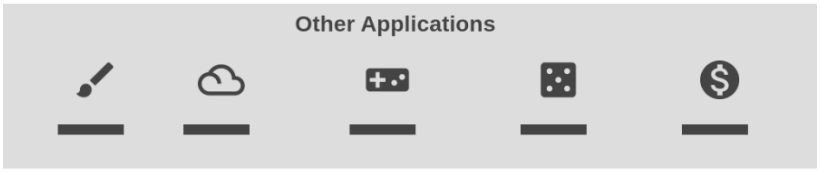
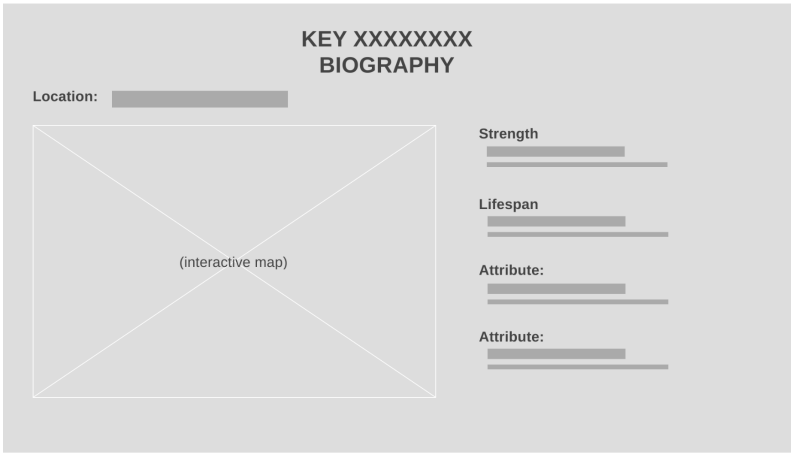


text

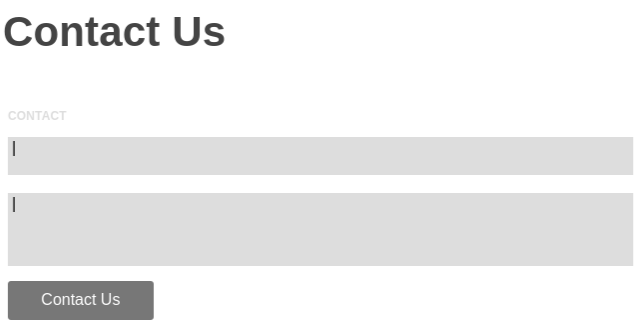
3.2.2. Key Generation Page

The Key Generation's page first section consists of the method generateKey(). The button will call the method and return an encryption key that was generated using lightning data in the area just below the button.



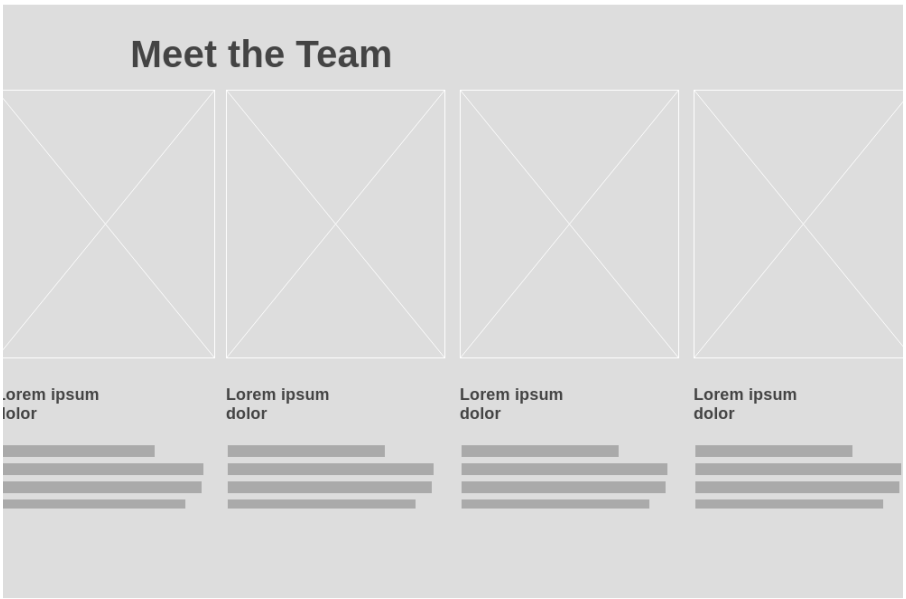
The second section of this page will include details about how the key was made. The additional details will provide the user with a sense of familiarity as they will be able to relate to some of these attributes. These attributes would be able to be easily understood and would be pulled from the corresponding lightning strike data.

3.2.3. Contact Page



The contact page will provide viewers with the option to contact the team members without exposing the individuals emails to the general public.This form will send an email to all team members as soon as the user hits the submit form button at the bottom of the contact us page.

3.2.4. Team Page



The team page will contain 4 sections, 1 for each team mate.

The boxed area will contain portrait images of each team member. The text below each image will show the names and email addresses of each team member.

3.3. User Interface Design Guidelines

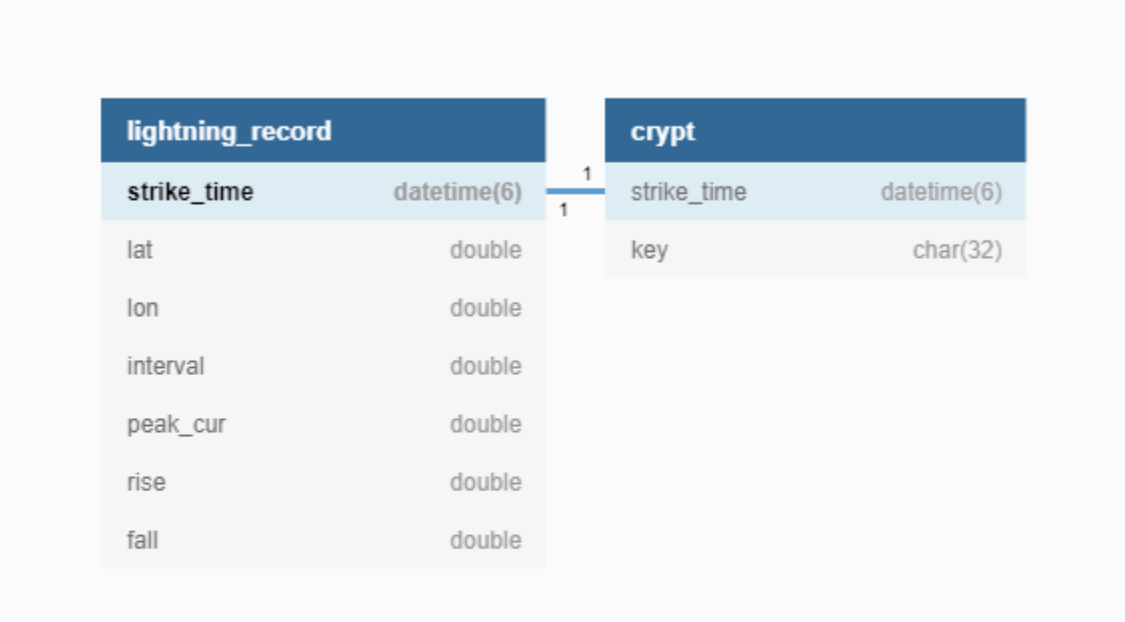
3.3.1. Structure: Clean and clutter-free

3.3.2. Consistency: Use of colors, fonts and layout is important for continuity of the user experience

3.3.3. Focus areas: Users should see a response when buttons are clicked on the website. A button which scrolls through a page should be fluid and comfortable to the user.

4. Database Design

4.1. The database is designed to store lightning data with the capability to store a key for each lightning strike. Lighting data will be entered as a lightning_record using the attributes selected in the Requirements Document.



4.2.

4.3.

Might also include:

- Goals & Milestones
- Timeline