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EE461L Phase 1 Report

URL's

Site: http://everyrocketlaunch.com.s3-website-us-east-1.amazonaws.com/
Github: https://github.com/qinyudiao/Software-Desgin-Lab-team-project

Team and Project Information:

Project Name: EveryRocketLaunch
Team Canvas Group: morning-8

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Motivation and Users

There has been a resurgence in the interest in space exploration in the past couple of years. Several companies have been developed with the hopes of exploring the new frontier, such as SpaceX and Blue Origin. As a result, there is an abundance of information related to the topic, but no centralized location to view all data. The goal of EveryRocketLaunch is to be that centralized location. Through the web application, users will be able to view different launches, space companies and even countries looking to expand to space.

EveryRocketLaunch is intended for anyone, from a space novice to even researchers as the web application will be pulling data from various sources. Thus, users will be able to view things like how much rocket costs, or which astronauts went on which launches. In short, anyone will be able to visit EveryRocketLaunch and learn something new about space.

Requirements

User Stories

1. As a user, I want to be able to view a video of failed rocket launches on an embedded video player.
    a. Initial Time Estimate: 30 minutes
    b. Actual Time: 1 hour
2. As someone interested in learning about rocket launches, I want to be able to click on different tabs that will take me to pages about companies, countries, astronauts, etc.
    a. Initial Time Estimate: 1 hour
    b. Actual Time: 3 hours
3. As an uninformed user, I would like to be able to visit a page that has information/link about rockets.
    a. Initial Time Estimate: 30 minutes
    b. Actual Time: 30 minutes
4. As a picky user, I want an animation of a rocket launching that I can view.
    a. Initial Time Estimate: 1 hour
    b. Actual Time: 45 minutes
5. As a user, I want to click on a link and see who contributed to the website.
    a. Initial Time Estimate: 2 hours
    b. Actual Time: 4 hours
6. As a curious user, I want to be able to see a short introductory film so that I can learn something about rockets.
    a. Initial Time Estimate: 30 minutes
    b. Actual Time: 1 hour

Customer Stories

1. As a researcher, I would like to look up specific companies, dates, or countries and get all related information.
    a. Initial Time Estimate: 5 hours
    b. Actual Time: 4 hours
2. As an aerospace engineer, I would like to see what the determined cause of failure was for unsuccessful launches.
    a. Initial Time Estimate: 3 hours
    b. Actual Time: 3 hours
3. As a scientist, I would like to see what the purpose of the payload that was launched by the rocket was for.
    a. Initial Time Estimate: 2 hours
    b. Actual Time: 3 hours
4. As an investor, I would like to see how much each rocket launch cost.
    a. Initial Time Estimate: 4 hours

    b. Actual Time: 4 hours
5. As an organized user, I would like to be able to sort the launch information in alphabetical order.
    a. Initial Time Estimate: 5 hours
    b. Actual Time: 3 hours

Design

The website directs the user to a splash page at first, which has a navigation bar and a carousel of three static and animated rocket launch images. The navigation bar consists of nine redirection buttons, a dropdown button, and a search button. The dropdown button and the search button are not fully implemented for this phase.

The nine redirection buttons are named “Every_Rocket_Launch”, “About”, “Launches”, “Companies”, “Countries”, “Astronauts”, “Failed_Launches”, “Education”, and “Map”. All the buttons redirect to a new page with the same navigation bar on top of the page.

“Every_Rocket_Launch” button redirects back to the splash or the landing page.

“About” button redirects to the About page, which contains some basic information about the website and the GitHub Statistics which is dynamically derived from GitHub’s API.

“Launches” button redirects to the Launch page, which presents the user all the rocket launches from the very first to the latest planned. The information is obtained through a database’s API. Each launch has a name, launch time, fail reason if failed, and a video link if there is one. Users can search through each attribute and/or sort them by alphabetical order.

“Companies” button redirects to the Companies page, which presents a list of companies with their purposes, headquarters, and countries. Each attribute can also be searched or sorted. The data is from the spacefund.com, we convert a .csv file to a .json file to use. In addition, each company name will redirect to its profile page, which is unavailable yet.

“Countries” button redirects to the Countries page, which is still under development.

“Astronauts” button redirects to the Astronauts page, which has three links, each link to one of the three categories of astronauts, US astronauts, Russian astronauts, and International astronauts. Each page has a table that presents all the astronauts under its category with his/her personal information. Each attribute can also be searched or sorted. In addition, each astronaut's name will redirect to his/her profile page, which is unavailable yet.

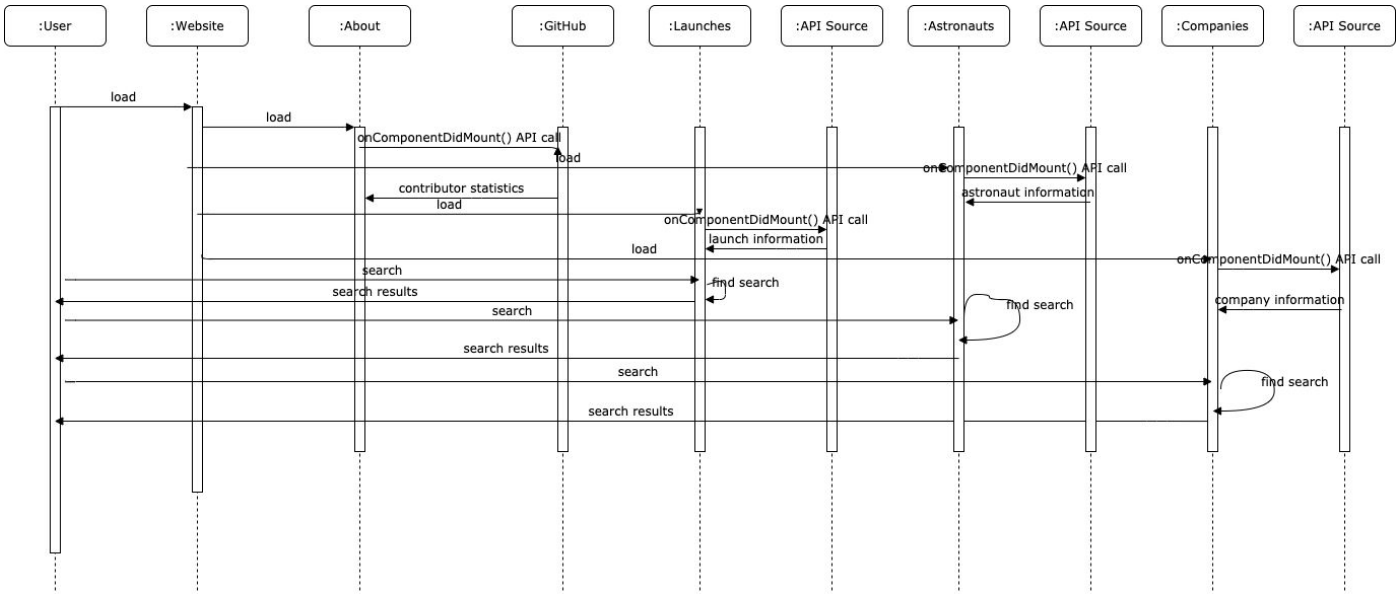
“Failed_Launches” button redirects to the Failed_Launches page, which has an embedded youtube player that plays a video of a compilation of rocket launch failures.

“Education” button redirects to the Education page, which has an embedded Youtube player that plays a short introductory film and some external links.

“Map” button redirects to the Map page, which has a partially implemented map.

Use Case Diagram

Sequence Diagram



Testing

We did not have a lot to test during this phase except for some basic black-box testing as our website is static for the most part. The main thing we had to test was our API requests for things like the Github statistics. In order to test the requests, we logged the response of the call to the console and observed the output. To test the actual website we clicked through different combinations of pages to see if our routing broke at any point.

Tools, Software, Frameworks

Frontend: We used HTML, CSS, and JavaScript with React to build the front end. With React, we were able to build components that can be reused throughout our project. For example, we were able to import a navigation bar we made into all our pages with a simple command, rather than having to put together all the necessary tags one would have to use with plain HTML. In order to make the website look better, we used bootstrap and react-strap and some React components created by other people. Thanks to the modularity of these libraries, we can just import what we need, such as the carousel on the landing page.

Hosting; We deployed our website to Amazon Web Services S3 and utilized Docker to make deployment easier. Docker generates our build files and then pushes them to the S3 bucket so that we do not have to do anything manually.

Models

Our models are companies, launches, and astronauts. The company model includes information about company location, purpose, and cost per launch. The launch model includes the mission name, date, status, and launch video if one exists. The astronaut model is divided by nation and includes relevant information about each astronaut listed.

We found two free databases that have information about the rocket launches that we need. The first one is https://spacefund.com/launch-database/, which provides detailed information about many aerospace agencies. We used this one to get the instances of information used in our company model. The second database is https://launchlibrary.net/docs/1.4.1/api.html which provides access to the database with an API. We used this database for our launch model instances.

For our model containing all of our Astronaut data, we used an open-source database from NASA as seen from the following link. From the model, we extracted each astronaut by country/company, name, gender, number of flights, total hours in space, etc. We plan to later develop this out to the point that the user can simply click on an astronaut name and be brought to a bio page containing more information about each astronaut.

Currently, the multimedia we have on our web application exists on the landing page, Education page, and the Failed Launch page. The video on the landing page is simply there for looks, but the videos found on the failed launches page and education page serve to inform viewers of the successes and failures of space exploration.

Reflection

Our team did a good job of learning the required skills to develop the website. For this phase, we had to learn how to use React to develop the frontend, how to deploy on AWS and how to utilize API calls to pull data. We were able to successfully separate the tasks so that each person did not have to learn every single thing. This gave them the opportunity to spend most of their time on a specific portion and become more well-versed in the tool, software, language, etc. Another thing we did well was finding the data for our project. We were able to find various datasets with very pertinent information for our users. However, there are some things we can improve on. One thing is becoming set on what data we want to display to the user. At the moment, we are displaying the data from our datasets, but not all of it is necessary so we need to go through the data to see what we can ignore. This way, the website is more digestible for our users. Additionally, we need to become more organized in how we approach the production of our features. There have been instances where we try to implement several

features at the same time and this impacts our design since we have to account for several things at the same time. If we did things in a more linear fashion, our design process would probably not be as complicated. Overall, we learned to start early and draw out what we want to do because visualizing the projects makes implementation easier.