2019-20 Group Project Inception --- Astronomical Learning
=====================================

Summary of Our Approach to Software Development
Our team will be using the Disciplined Agile Delivery approach of software development. Our sprint iterations will be 2 weeks consisting of product review meetings, backlog refinement meetings, sprint retrospective meetings and stand-up meetings.

Initial Vision Discussion with Stakeholders
For those interested in all things space who want to learn more about SpaceX and NASA missions and space itself, the Astronomical Learning Website is an informational system that will allow people of all ages to learn about SpaceX, NASA and space in a variety of ways. Visitors will be able to see what missions SpaceX and NASA have completed and be able to view various information about each mission. The website will also include other ways of teaching people about what goes into space missions and other aspects of space. This will include interactive media such as games and quizzes. Unlike SpaceX's launch manifest (https://www.spacex.com/missions), our product will be able to deliver more detailed information about SpaceX missions and in a format that is more appealing to younger audiences alongside a much larger scope of topics.

Initial Requirements Elaboration and Elicitation

Interviews
> Q. With all information publicly available, why would a user want to register for an account on this page?
>> A. Initially, we don't want all the information available.We want a user to register for an account to access finer details about launches or other space information. Also, a user may want to register if they were willing to access quizzes and acquire profile points for games, quizzes, and contribution to the site.

> Q. The target audience is younger in age, how are we planning on capturing and maintaining their attention while being educational?
>> A. Instead of having a bland looking site that displays all the information about a particular topic, we would like to have simple but pleasing graphics or types of transitions.

> Q. How should the creation of administration accounts be handled?
>> A. We would like for there to be a single admin account to appoint other users as admins. Admins should not be any regular users, but a trusted and authorized users. Regular users can apply to be admins but multiple admins have to agree and accept a regular user as an administrator.

Q. How are comments going to be handled / moderated to ensure that users aren't subjected to malicious content?

    A. Administrators would be the ones to ensure that users are not subjected to malicious content. Typically, when a user submits a comment, we would like the administrator to view 'not-yet' accepted comments and not just check for inappropriate language, but also check if the comment is related to the topics of the application. Only then may the administrator be able to accept a comment for public viewing.

Q. If we lose access to one of the API's is there potential solutions to the problem?

    A. If we lose access to one of the API's we would like to have some type of place-holder for when the information is to be displayed. For example, when it comes to the SpaceX Timeline API, we would still like to display the name of the missions and displayed in an order, but the non-existent information would be represented as "Information currently not available."

Other Elicitation Activities?

####Project Risks
-User stories being inadequately defined may lead to confusion or lack of cohesion between developers
-The potential to lose a team member mid project is a reality
-API's may no longer be supported in the long term, so contingencies may be necessary
-A team member may not complete their full sprints task which may throw off the overall project scheduling for full implementation completion by sprint 6.
-Additionally the changing of any critical personnel may also lead to the same problems as above.

List of Needs and Features

- There should be a homepage that is modern in style and advertises the different features currently available on the web site. The home page should provide links to these features as well.
- There should be an omnipresent navigation bar that provides simple and quick access to all the features currently available on the web site.
- Administrators should be able to have uniquely typed accounts that allow them to alter content on the website and edit or delete user comments, and in the future be able to view website demographic information. Additionally, they should be able to moderate non-administrator user accounts in case of malicious behavior either via temporary lockouts or by permanent lockout of the account.
- Visitors should be able to register for an email verified user account that allows them to post comments, delete their own comments, have a basic profile page, and track the

progress of certain website activities which will award badge upgrades, displayed beside their usernames.
- We should display detailed information about SpaceX mission launches, this data should be acquired through the SpaceX API.
- We should display detailed information about major NASA missions of the past.
- For both the NASA and SpaceX sections, we should have interactive timelines that show past events (launches and missions) that when clicked on will display the information for that event dynamically without a page load.
- We should have embedded videos for mission launches where available for both NASA and SpaceX missions, if videos of an event aren't available then it isn't expected for that specific mission or launch.
- Visitors should have access to all the information available about our known universe. This includes sections about our solar system, the sun, the moon, space debris (meteors, comets, etc), the stars and the universe beyond our solar system.
- Visitors should be able to learn about the importance of space suits when it comes to both space travel and living in space, both flight suits and extravehicular activity (EVA) suits should be documented.
- We need a number of daily updating pieces of content so that the website never feels monotonous upon revisits. A picture of the day will be implemented through NASA's APOD API. A fact of the day will be implemented through a database unless an API can be found to satisfy this condition. A "Today In History" will be implemented which will share historical events that occured on the same day/month in a year of the past.
- Every major information component should have associated quizzes that users may take to test their knowledge. These quizzes should have varied difficulty levels that have appropriate levels of rewards for registered users.
- There should be an event calendar that shows past events which are also interactable. Clicking on the event should redirect the user to the relevant page on the web site.
- Simple games should be implemented to help break the monotony of information and allow visitors to interact with the website in a way that is designed solely for enjoyment. Every game should be space related and have relatively simple control schemes so that younger players may enjoy them as well. These should be done using HTML5 and Javascript so that they run effectively in a browser window.

Initial Modeling

Use Case Diagrams

Other Modeling

Identify Non-Functional Requirements
- Databases must be hosted on Microsoft Azure
- Website must be hosted on Microsoft Azure
- Website should never return error pages, custom error handling should exist.

- Default language will be English. Localization to other languages may be considered in the future.
- User passwords should not expire
- Website downtime should be kept to a minimum, we want this tool to be readily available to users.
- Pages should not take longer than 3 seconds to load as the abandonment rate of a page drastically increases after that time.
- Optimization for mobile does not need to be considered in the short-term.

Identify Functional Requirements (User Stories)

E: Epic
U: User Story
T: Task

[U] As a visitor, I would like to be able to see a modern and detailed home page when I first come to the web site that details the currently available features of the site, so that I know what features are available.

[U] As a visitor, I would like to have an omnipresent navigation bar that makes it quick and simple to navigate between the different features on the website, so that I can easily navigate between different features.

[E] As a visitor, I would like to see an interactable astronomical map that can lead me to different locations of information. It should have links to most, if not all major features available, so that I can move between features in a fun and interactive way.

> [U] As a visitor, I would like to be able to see an interactive map of the solar system that whose elements can be clicked on, so that I know what features are available.

> [U] As a visitor, If i click on an entity within the solar system that has multiple associated features I would like for the map to zoom in on the entity I clicked on and display all available features, so that I can view information about that entity.

> [U] As a visitor, I would like to be able to zoom the map out so that instead of viewing our solar system, I am viewing a galaxy map that can redirect me to the associated features, so I can view information about the galaxy in an interactive manner.

[E] As a visitor, I would like to be able to learn more about the Sun, so that I can be better informed about its importance.

[U] As a visitor, I want to be able to learn information about the sun, so I can learn more about an important part of our solar system. (composition, functions, how it works, size, etc).

[U] As a visitor, I want a page with interactive and visual elements, so I don't feel like I am just reading. (Layers of the sun, size compared to earth, distance from earth).

[U] As a visitor, I would like to be able to see a visual representation of the position of the sun, so I can see how the sun affects different areas on earth at different times of day and different days. (SunCalc API)

[E] As a visitor, I would like to be able to learn more about the Moon, so that I can be better informed about its importance.

[U] As a visitor, I want to be able to learn information about the moon, so I can learn more about an important part of our planet's workings. (composition, functions, size, etc).

[U] As a visitor, I want a page with interactive and visual elements, so I don't feel like I am just reading. (size compared to earth, surface of moon).

[U] As a visitor, I would like to be able to see a visual representation of the position of the moon, so I can see how the moon affects different areas on earth at different times of day and different days. (MoonCalc API)

[E] As a visitor, I would like to be able to learn more about other aspects of our solar system, so that I may better understand nearby space entities.

[U] As a visitor, I want to see basic information about the planets in our solar system, so I can know some simple facts about the planets.

[U] As a visitor, I would like to see additional information about mars, so I can learn about the recent discoveries about it.

[U] As a visitor, I would like to see information about space debris, so that I may learn more about things like comets and meteors.

[U] As a visitor, I want a page with interactive and visual elements, so I don't feel like I am just reading.

[E] As a visitor, I would like to be able to learn about space beyond our solar system, so that I know about what exciting things exist in space.

[U] As a visitor, I want some information about the Kuiper belt, so that I can learn about what exists right outside our solar system.

[U] As a visitor, I would like to learn about the milky way galaxy, so that I can learn what exists within our own galaxy.

[U] As a visitor, I would like to learn about the andromeda galaxy, so that I can learn about the closest known galaxy to the milky way galaxy.

[U] As a visitor, I would like to learn about space beyond the andromeda and milky way galaxy, so that I know what exists in deep space.

[U] As a visitor, I want a page with interactive and visual elements, so I don't feel like I am just reading.

[E] As a visitor, I would like to be able to learn about the stars, so that I know more about what I see when I look into the night's sky.

[U] As a visitor, I want to be able to learn facts about stars, so I can learn about a major component of our universe. (life cycle, creation of elements, comparative sizes)

[U] As a visitor, I would like to learn about the different star constellations near earth, so that I can recognize them myself.

[U] As a visitor , I want a page with interactive and visual elements, so I don't feel like I am just reading. (graphic of relative sizes, graphic of various forms of stars)

[E] As a visitor, I would like to learn about different SpaceX mission launches, so that I can learn more about rocket launches.

[U] As a visitor, I would like to view data about SpaceX launches, so I can learn more about how they function. (payload details, rocket information, orbit details, mission patches an details)
[T] Get access to the api.
[T] Create controller functions to get data.
[T] Create javascript and ajax calls to get data.
[T] Create a page to display data.

[U] As a visitor, I want to be able to see a timeline of the SpaceX launches, so I can learn more about how missions have changed over time.

[U] As a visitor, I want to be able to view videos of SpaceX mission launches, so I can get a visual representation of what a launch looks like.

[U] As a visitor, I want to be able to learn about what SpaceX does, so I can get a basic idea of what the company is.

[E] As a visitor, I want to be able to learn more about NASA, so I can understand what they have accomplished over the years.

[U] As a visitor, I want to be able to see information about Nasa launches, so I can learn more about space missions.

[U] As a visitor, I want to be able to see an interactive timeline of NASA's mission, so I can learn about the history of space missions.

[U] As a visitor, I want to be able to view videos of NASA mission launches so, I can get a visual representation of what a launch looks like.

[U] As a visitor, I want to be able to learn about what Nasa does, so I can get a basic idea of what the company is.

[U] As a visitor, I would like to be able to learn more about flight suits and extravehicular suits, so that I understand the purpose they play in space travel.

[E] As a visitor, I would enjoy it if there were a variety of games, so that I could play something to take breaks reading.

[U] As a visitor, I want to play games related to space, so that I can interact with the website instead of only reading facts.

[U] As a visitor, I would like to see a list of scores, so that I could improve my game play and hopefully out-perform some of the top scores.

[U] As a registered user, I would like to see my personal high scores on my profile page, so that I know how the best I've personally done.

[E] As a visitor, I would like to be able take quizzes on a variety of topics, so that I can test my knowledge.

[U] As a visitor, I would like single questions that appear near the content in which I am being asked about, so that I can test my knowledge as in small increments.

[U] As a visitor, I would like different types of quizzes, so they don't all feel the same, things like lightning rounds and timed questions.

[U] As a visitor, I would like to be able to retake quizzes and have a different set of questions, so that I'm not answering the exact same set of questions every time.

[E] As an administrator, I want to be able to create an administrator account, so that I have access to additional functionality.

[U] As an administrator, I want to have the ability to view submitted comments and accept or deny them, so that I can assure that malicious comments are never seen on the site.

[U] As an administrator, I want to be able to delete already posted user comments, so that I can remove any malicious content that may have been accepted incidentally or with malicious intent.

[U] As an administrator, I would like to be able to ban user accounts either temporarily or permanently if they are found to be malicious users, so that we can protect other users from continued malicious activity.

[U] As an administrator, I would like to be able to view website demographic information, so that I can better understand the interests of the visitors.

[E] As a visitor, I would like to be able to register for an account, so that I may have access to additional features on the web site.

[U] As a visitor, when registering for an account, I would like to register with a unique username, an email address and a password, so I can have access to special features.

[U] As a visitor, I would like to receive an email to verify my account credentials and activate my account, so that I know other users have gone through the same verification process.

[U] As a registered user, I would like to be able to make comments on different pages, so that I can leave my thoughts about different subjects.

[U] As a registered user, I would like to gain points for completing certain activities on the website, so that I can upgrade a badge that is displayed beside my username.

[U] As a registered user, I would like to have a basic profile page that displays my history of comments and my current badge progress, so that people can learn a little about me and what I've done on the site.

[U] As a registered user, I would like to be able to delete any comments I have made in the past, so that I can remove any posts I made with mistakes in them or on topics my opinion has changed about.

[U] As a visitor, I want to see a calendar that shows any launches in previous or latter months, so that I can keep track of launches.

[E] As a visitor, I would like to see some elements that are new every day, so that revisiting the web site feels purposeful.

[U] As a visitor I want to see a new "fact of the day" on the homepage, so I can learn something "new" when I first come onto the site.
  [T] Create a table to store facts.
  [T] Add code to grab a fact from the database.
  [T] Create an area on the home page to display.

[U] As a visitor, I want to be able to see a historical moment that happened on the current date, so I can learn more about the history of space.

[U] As a visitor, I want to be able to see a random picture of space everytime I visit the website, so I can see an idea of the wide variety of things in space

[U] As a visitor, I would like to be able to register to receive emails with the daily content components, so that I don't miss the "of the day" components if I don't visit the site that day.

[U] As a visitor, I would like to learn about the International Space Station, so that I can better understand the functions and accomplishments of an amazing international space effort.

Initial Architecture Envisioning

Agile Data Modeling

Timeline and Release Plan
  ● February 10, 2020 - Induction Phase End
  ● February 24, 2020 - End Sprint 1 (Release Date 1)

- March 9, 2019 - End Sprint 2 (Release Date 2)
- March 30, 2019 - End Sprint 3 (Release Date 3)
- April 13, 2019 - End Sprint 4 (Release Date 4)
- April 27, 2019 - End Sprint 5 (Release Date 5)
- May 11, 2019 - End Sprint 6 (Release Date 6)
- May 28, 2019 (Final Release / Showcase)