Background: Marvel Entertainment, LLC, is a subsidiary of The Walt Disney Company. It is one of the most prominent character-based entertainment companies, with a library of over 8,000 characters, that have been featured in a variety of media, over seventy years. Currently, Marvel Studios has produced ten films that have grossed over seven billion dollars (the second-highest grossing film franchise) with seven more to be released between 2015 and 2018. (source: http://marvel.com/corporate/about)

Purpose: As more characters from the Marvel universe get introduced to the general public through mainstream media, the curiosity of the character origins and connection to the larger scheme of things will grow. Therefore, the purpose of the application is to allow comic book fans and potential customers to explore the Marvel character library in a more interactive and visual way on the Marvel website. (Note: this prototype is to demonstrate a potential tool that could be implemented on the official Marvel website.)

Audience: The underlying assumptions of who the users will be are comic book lovers, adolescents and those who have seen a Marvel movie or TV show.

Goal: The primary goal of the application is to allow the users to explore each Marvel character’s origin, and the metadata (name, alias, origin, stats, etc) related to that specific character.

Application overview: The application achieves the goal previously mentioned by displaying three color location identifiers on a United States map. The size and color of the loci identifier changes based upon the number of characters in that location and the character type in the location (hero, villain, or both). The user then is able to explore the various characters in a given location by clicking on the identifier. From there, a modal appears displaying the characters metadata. If there is more than one character in the selected location, the user can click through the modal to display each of the character’s metadata. The users can also search by using the dynamic stat queries which will change the map location identifiers size and color based upon the parameters set. In the character modals the stats (durability, fighting, speed, energy, strength, intellect) are nominal data displayed as a bar chart to show each of the quantitative values that make up the characters strengths & weakness. In essence these are parts-to-whole.

Data Sources: www.superherodb.com (character origins, names, alias, stats and etc)
User Interface & Data Visualization Walk through:

**Image 1:** Application view “above-the-fold”.

**Image 2:** Map View

The above image displays the location identifiers and index key. This location identifiers show density of the character population by the size of the circle and the types (hero, villain, both) of characters that reside in the given location.
Image 3: Map View + Dynamic Stat Query

The above image displays how the location identifiers change to reflect the parameters set by the dynamic stat query. As you can notice the changes in durability, fighting and speed have decreased the number of character locations and characters identified on the map along with the color and sizes that represent the number of characters in the location and the type of characters in the given location. The purpose of this is to allow the user to filter out some of the data.

Image 4: Map View + Character Modal

This image shows when a location identifier is selected, a character modal appears to display the characters in the given locations and their metadata.
The character modal allows the user to scroll through each of the characters that are located in the given location and their respective meta data. The meta data includes their character name (example: Moon Knight), whether the character is a hero or villain, alias, location and it’s stats (durability, fighting, speed, energy, strength, and intellect).

The character stats are nominal data displayed in a bar chart to show each of the quantitative values that make up the character. In essence each of the stats represents parts of the whole character that can be compared and contrasted against themselves as well against other characters.

**Image 5: Character Modal**
Technical Specifications

Programming and Framework

HTML5, CSS3, Javascript, JQuery, JSON, CSV

Plugins and other Javascript frameworks used
Leaflet.js (for implementing custom boundary map)
rangeslider.js (for implementing ranges slides to use for the dynamic query filters)
HorizBarChart.js (for implementing horizontal bar charts)

How to implement the application
1. Created the HTML5 markup for the given design mockups
2. Customized with Bootstrap CSS framework
3. Created a custom CSS for styling
4. Used leaflets to create a custom boundary map
5. United State SVG data fed into us-stats-us along with the dataset pickup from CSV file and fed into the same JS file to act as Data model
6. Created elements.js to handle the following functionalities
   • Create the custom map on the markup with the use of leaflets functions
   • Plot the data points on the map using longitude and latitude data, so that when the user clicks on it the modal is displayed
   • Display modal to show character meta data, and image
   • Implemented various delegates for handling actions
   • Process the data for making sliders functional so that appropriate data comes up
   • Implemented filter functionality using filters and checkboxes
   • Array is update whenever values of * parameters are changes. The size of the circle and the color of the circles are dynamically changed by calling reset values from array.

Running the application prototype: Run visualisation.html found in the Marvel Origins folder.