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# Data Visualization with Data Mining

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VEGA  
Capstone  
Spring 2020

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**Andrew**

# 1 Overview and ACM Keywords

- Overview of the Project is to mine, store, and visualize data.
- ACM keywords include:
- Database Administration
- Web Mining
- Web Applications
- Database Design and Models

# Discussion of data in today's society

- Data is really all around us, and can be inferred from multiple means.
- Many businesses use data in their operations.
- Inside many business, data is used differently among divisions (e.g. comparing marketing uses to HR uses).
- As a result, many companies sell tools to facilitate storage and visualization.
- Examples include SAP, Salesforce, Tableau, Microsoft PowerBI.
- Database examples include MS SQL Server, and Oracle Database.

# 1.1 Problem

- While there are many excellent data visualization and storage tools, they cost money.
- Non-profits, startups, small businesses, etc. may struggle with paying those fees.
- Also, for some issues, a tool may not even exist for it.
- Hence, we have to devise a way to mine, store, and visualize data. Making our own tool.
- Many of our coworkers may not be tech people, so it has to be easy to use.

## 1.2 Motivation

- Our motivation stemmed from our common interest in data and databases.
- We wanted to utilize our classroom knowledge, but also build upon it, through implementation and deployment.
- Doing this project would also give us valuable experience for jobs we envisioned and wanted for ourselves.
- Working, as two groups of two, we each had our own goals, but wanted to see how we could merge.

## 1.3 Description

- Would be full stack
- Would feature a mobile app web viewer
- Would have data in a database, which could be called upon to be visualized
- Could also offer the data, as a stand-alone, to those who had their own means to work with it.

## 1.4 Scope

- Goes without saying, COVID really set society, as a whole back.
- We were limited in face to face, in-person interaction.
- We couldn't really go about handling account creation, management, authorization.
- We didn't really have time to develop API keys for our project.
- Finding free APIs to work with.
- Balancing this class with our other classes, work, etc.



**Eduardo**

## 2 Team and Tasks

- Andrew - Suggested use of APIs, and making own. Established database scheme, and designed the backend code. Web-master.
- Eduardo - Took reigns of app development. Learned about App Inventor. Assisted with testing and quality check, overall for project.
- Victor - UI/UX Lead. Javascript guru. Did the most lines of code of the whole endeavor.
- Giovanni - Assisted with design, CSS, etc. Helped in keeping the two teams on track and on schedule. Got members, such as Andrew, up to speed on what tools are out there for data visualization.

## 3.1 Architecture (languages, tools, etc.)

- XAMPP
- HTML / CSS / core JS / JQuery/ AJAX / loader.js
- JSON
- RESTful APIs (primarily consumption GET)
- GoDaddy and cPanel
- Google Play Console
- Exchangeratesapi.io , oilpricepi.com, newsapi.org, iexcloud.io
- Postman

## 3.2 Data Analysis

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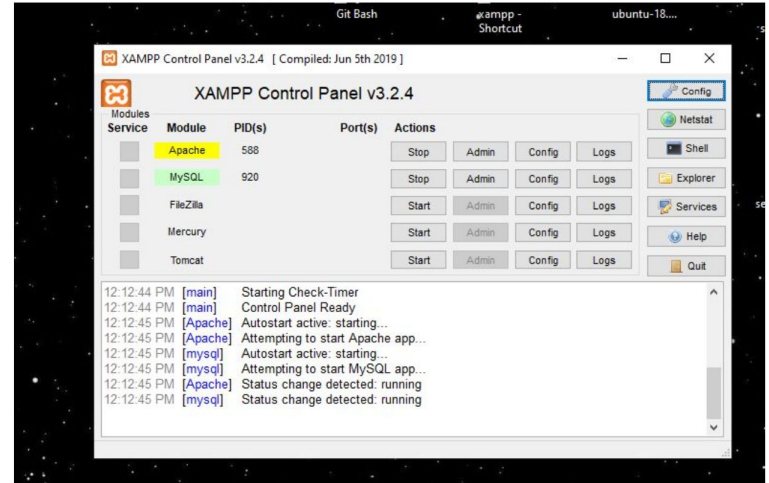
**Victor**

## 3.3 Supporting Images

- XAMPP was a consolidation of multiple tools, and allowed a main control panel.

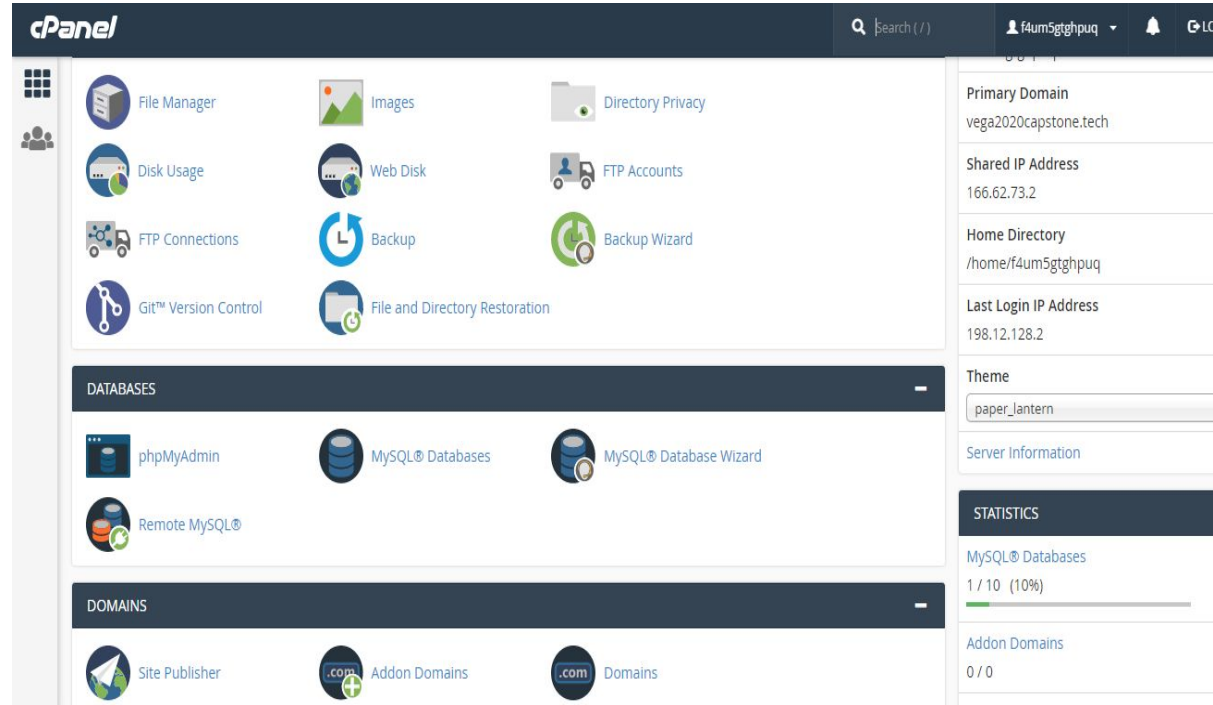
### Working with XAMPP

- Allows us to turn our computer into server (localhost), and run server side operations.
- Same for database events.
- Open Control Panel ShortCut
- Click start on Apache and MySQL parts



## 3.3 Supporting Images

- cPanel tool suite, when logged into GoDaddy. Able to handle system admin roles from here.



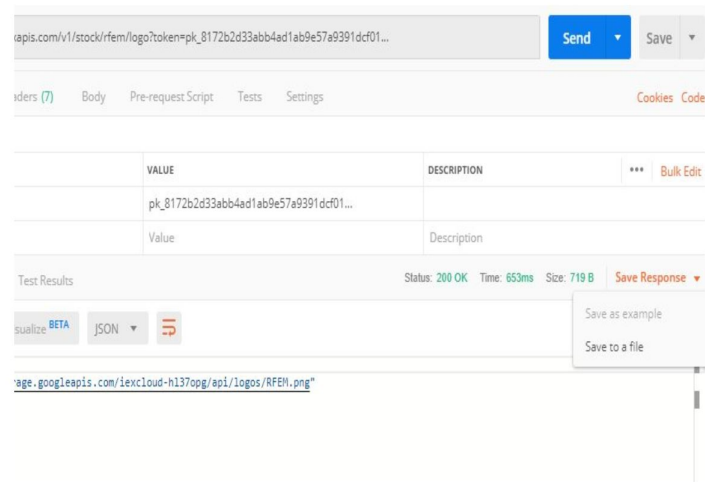


## 3.3 Supporting Images

- Using Postman to test APIs.

### Initial database setup

- We used Postman to visualize and perfect our API calls
- Once we got our proper calls, we downloaded the output into JSON files.



## 4 Challenges and Takeaways

- Started out keeping realistic expectations, to avoid unexpected road bumps.
- Discussed things greatly, before undertaking.
- We decided we couldn't include API keys, which are used in real world cases to impose quota. Wouldn't administer accounts.
- Had to use free/cheap APIs. Meant data wouldn't be all the way up to date (close in majority of cases)
- We couldn't find time to make an app from scratch, and since it was viewer, used App Inventor.
- Really wanted to apply machine learning, but would take too long to set up the data specifically.

**Giovanni**

# 5 Future

- We are proud of how hard and tirelessly we worked.
- Not only did we develop technical skills, but soft skills like communication.
- Would like to see how creating and administering accounts could have went.
- Could have also seen how it would have worked with API keys.
- Would have liked to learn the emerging Kotlin language, inorder to make an Android App from ground up,...or Xamarin (.net/c#) to make Android/IOS/Windows in one fell swoop.

## 6 Additional Notes

- In Order to have accomplished this, we needed deeper understanding of web technology.
- Needed to keep track of terms learned.
- Recommended, as it validates project if end result is underwhelming.

## 6. Additional Notes

Another example was mobile development. We understood how it worked from a technical standpoint, but wanted to really learn how App Publishing worked. All while learning even more about the coding aspect. (External links in blue, and we originally used font size 14 for this)

- [Postman API tool - tutorial](#)
- [JSON vs JSONP](#)
- [Fetching HTTP headers current request in PHP](#)
- [finding Errors with PHP cURL](#)
- [Pagination of API results](#)
- Handling nested JSON arrays with PHP
- [VMware interfering with XAMPP](#)
- [JS libraries that can help with data visualization](#)
- [AWS calculator to help business estimate cloud costs](#)
- [List and descriptions of all AWS services](#)

## 6. Additional Notes

- [Another neat AWS link](#)
- [API gateway with PHP and Lumen](#)
- [REST with PHP](#)
- [cURL vs Postman](#)
- [Idempotent \(Can be used in Math or CS\)](#)
- [some API terms](#)
- [more API terms](#)
- [storage Engines](#)
- [algorithms and storage engines](#)
- [info on embedded database engines](#)
- [examples of embedded database](#)
- [in-memory databases](#)
- [list of in-memory databases](#)
- API documentation providing embedded code samples for multiple languages

# 7. References

List of Top Business Intelligence (BI) Tools 2020. (n.d.).

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Pearce, R. (2013, March 28). Dead database walking: MySQL's creator on why the future belongs to MariaDB. Retrieved from <https://www.computerworld.com/article/3463901/dead-database-walking-mysql-s-creator-on-why-the-future-belongs-to-mariadb.html>

Rice, M. (2019, July 23). 17 Data Science Applications & Examples. Retrieved from <https://builtin.com/data-science/data-science-applications-examples>

Theuwissen, M. (n.d.). The different data science roles in the industry. Retrieved from <https://www.kdnuggets.com/2015/11/different-data-science-roles-industry.html>



# And a look into the working project.

- Desktop View
- [www.vega2020capstone.tech](http://www.vega2020capstone.tech)
- Android App
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**Fin.**

**Questions? Comments?**