CIS 465

Final Deliverable

May 3, 2015

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Summary

Much of what I have been working on this semester involved back end programming and front end programming with D3 and Leaflet maps. The semester started out with various projects assigned each week, but soon was targeted mainly toward D3 and leaflet projects that involved a database of fake student data given to us from Western Carolina University.

I started out with backend programming by utilizing the student data as it was given to us in Microsoft Access database format. A great deal of research was involved in how to access this database through C# code. Part of this research also involved utilizing some sort of stored procedure within Access. Much to my dismay, as I soon learned, stored procedures with Access are not the same as stored procedures in SQL. I managed to accomplish this through usage of the sprocs in my code. Access sprocs are shown as functions, or views and not listed in the server explorer tab of Visual Studio as stored procedures. Their functionality worked just the same, but in my opinion they are very limited in what they could do compared to SQL sprocs. You can only do basic queries in Access (select, update, insert, delete) and nothing too complex such as pivot tables, and some calculations. It is my opinion to convert any access database over to a local DB.

I wanted to take the data from Access and somehow put into a usable format, particularly a JSON format that is compatible with doing D3 and Leaflet maps. I developed code to convert a gridview into several usable formats such as a .csv file, and JSON format. I also developed code to convert a datatable to a .csv and JSON format that could be potentially used with data visualization code, whether it be D3 or Leaflet (herein referred to as DV).

With the limited use of stored procedures in Access, I later converted the database to a local database in Visual Studio (instructions for doing that are attached to the uploaded file). My goal was to take some aspect of the data given to us and incorporate it onto a map. I decided to take a map of North Carolina and display, using Leaflet, NC counties and their respective boundaries. I then developed code for a popup so when the user hovers over a county the median GRE for each county is displayed.

One of the columns in the database reflects student status per county. This status is either a student is admitted, not admitted, waitlisted, rejected, or no action taken. I created a stored procedure and used a pivot table to break out the status into separate columns per student, per county. I created a regular map showing this data on popup. I then created a choropleth map showing the same data but with a legend of colors and a scale to show the most populated student status areas.

I found that hardcoding the colors was a bit tedious and felt there should be a simpler solution. After much research, I discovered a website named [www.colorbrewer2.org](http://www.colorbrewer2.org) that contains various color schemes that could be easily used in leaflet code. I downloaded the entire library as an external JavaScript file and assigned the entire collection of colors a variable name. This can be seen in the JavaScript file called choroplethcolors.js located in the NC County application. I was then able to reference this variable name in my code along with the color scheme I wanted to use and how many of the color scheme I wanted to use in the choropleth map. This was much easier to do, as I only had to change one thing in my code as opposed to multiple lines of code with the rgb color names.

Lessons Learned

When I took CIS240, I was not into the google maps and geolocation activities and exercises. My first thought was I will probably never do anything like this again. However, after working with D3 and Leaflet maps, I have completely changed my mind. The reason being, I am actually creating a map from the ground up which makes the process much more interesting especially for those who enjoy front end and back end programming. Creating maps, graphs, bar charts, and pie charts is unlike anything we have done in the past. These new avenues is certainly worthy of a bullet item on my resume. My suggestion to future students is be creative with data visualization and learn as much as you can from it. It is quite a thrill to see the maps come alive with code that one has written.

Even though I am graduating this semester, my strategy is to maintain a working knowledge of data visualization, especially Leaflet maps. From what I have researched, and learned from the team leader, the hottest topic now is data visualization. Business leaders want a little more than words on paper. They want to visualize the information whether it be with a map, or pie chart. My goal for the maps that I created was to enlighten the business leaders that provided the fake student data in hopes they would use what I created.

Final Self-Assessment

1. Anthony Downs
2. Weeks 13-16

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| --- | --- | --- |
| Week | Dates | Hours |
| Week 14 | April 13-19 | 6 |
| Week 15 | April 20-26 | 3 |
| Week 16 | April 27 – May 3 | N/A |

Minimum Hours Billable – 6 hours

Billable Hours – 9 hours

Difference – 3 hours

1. Expectations for Satisfactory Employee
   1. **Reliability and Consistency** – As I have written in the past, I consider myself a reliable employee who completes all assigned tasks on time if not early. I try to have something to demo each week, but sometimes my work involved research and further reading to improve upon what I had already done.
   2. **Weekly Summary Email** – I ensured that my email was sent in a timely manner. There was a couple of occasions wherein this was not done; however, after a reminder from the team leader, the email quickly followed.
   3. **Quick Communication Response Time** – My turnaround time for communicating with the team leader continued to be prompt throughout the semester. I strived to address all issues via email response or in person during office hours.
   4. **Make Your Billable Hours Target** –I continued throughout the semester to ensure that I met and went above the target billable hours. A lot of research, reading, and effort goes into my tasks and therefore is reflected in the number of hours billed each week. I, again go above and beyond what is expected each week.
   5. **Task Completion** – All of my assigned tasks were completed or were in process of being completed throughout the semester. This was achieved due to my desire to learn more and do a good job on the tasks given.
   6. **Team Meeting Times** – I continued to be on time if not early for all team meetings. I utilized the early times to help my classmates with any problems I felt I could resolve.
   7. **Ask Questions When You Need To** – This has and never will be a problem for me. A person is not going to learn unless they ask questions.
   8. **Don’t Ask Questions When You Don’t Need To** – the previous statement speaks for itself as applied to me.
   9. **If You Do Make A Mistake, Do Not Make It More Than Once** – Learning from one’s mistake is always best. The key is to not make the same mistake twice.
2. Expectations for Good/Great Employee
   1. **Impress Your Team Leader** – I tried my best throughout the semester to surpass what is expected of me in the eyes of my team leader. I felt I did this based on the overall ‘wow’ affect I received when showing some of my demo work.
   2. **Initiative** – My initiative to learn and be the best I can be goes hand-in-hand.
   3. **Put In The Hours Needed** – I worked hard on all of my projects throughout the semester and most definitely put in the time each week to accomplish them. This goes without saying considering the positive difference in billable hours as show on each of my self-evaluations.
   4. **Find Something About The Project To “Own”** – As stated in previous evaluations, I wasn’t sure about ‘owning’ some part of a project in the beginning. However, this has changed with respect to what I worked on during the semester. I feel now that I have accomplished what I set out to do, keeping in my mind there is always room for improvement.
3. Overall Evaluation
   1. Overall I would again continue to say I have exceeded expectations and would rate myself as outstanding.
   2. Even though I am graduating, my thirst for knowledge will continue even throughout my employment which I consider the next phase of my life in programming.