Course Summary, Lessons Learned and Suggestions

What we learned:

As a Civil Engineer (with some Computer Science familiarity) my experience generally relates to the front-end of the GIS process. As a result I learned much about the inner workings of the databases and how data is represented. I particularly found the representations of area objects interesting since those are so different from traditional relational databases.

As a Computer Science student, although I’m familiar with several algorithms and data structures. There are certain new interesting concepts like R, R+ trees that I haven’t encountered before. Many geographical concepts from GIS area are also new for me.

For traffic we primarily deal with nodes (intersections) and arcs (road segments) which have a very different data structure. It was also interesting to learn about the methods of processing these area objects through methods such as overlaps, borders, etc. Along with this was learning about vector vs. raster data. While I had encountered them both before I never really thought about the differences between them nor the applications best served by both.

While less the focus of the course I learned a lot about general databases and SQL. Learning SQL has been on my to-do list for a while so getting a chance to delve into it, however briefly, was nice. As part of this I learned about the nature of relational databases and the problems and techniques that arise from having a number of separate databases tied together by various keys. While I have had previous experience learning about the various search techniques (such as a binary search) it was a nice refresher and I learned about their spatial versions (such as the B-tree).

We also learned a lot about spatial-temporal databases (or temporal ones in general). The importance of distinguishing transaction time and valid time, for example, was a new idea to us. General storage techniques were also new, such as snapshots, event tracking etc. These different types of databases were something we had used before without really thinking on it so taking the time to look at them in more detail was interesting and will help when considering temporal data in the future.

Overall we feel like we learned a lot about how the databases work and in particular what things to consider when designing a database. In the past we have generally come up with the data storage methods as needed when working on applications so looking at them in a more
scrutinized manner and planning them as part of the initial process was something that should help us in the future.

**Suggestions:**

One of the most obvious suggestions would be better planning overall, particularly regarding the assignments. I understand this is a new course so it was expected, but having a better idea about whether there were actual exams and what was due when would be nice. I felt the homework assignments, while interesting, were kind of disconnected from the course. The SQL assignments felt like more of an exercise with looking up syntax without really getting a sense for how they are applied. The data gathering assignments (the landmarks and the trajectory recording) I felt would be improved by having us actually work with the data in a database by creating the database, updating it etc. I also think the web, lab and homework portions would be better as individual tasks as it was most efficient to just split them up between us while the other person didn’t learn from them unless they made an effort to. Several web assignments are interesting and expose us to different web and spatial technologies. Overall I feel the content was interesting, but the assignments could use some refinement.