469 is intended to build your hands-on experience based on the materials you learned in 269. You can choose to do one of the two projects described below to fulfill the requirement of 469. The project can be done individually or in a group of 2-4 students.

For each option, there are two phases. Phase 1 is due before the 7th lecture. Phase 2 is due one week after the last lecture.

**Option 1 (Using queries in a database to build business intelligence):**

This option is intended to provide you with valuable hands on experience in designing and implementing a real world database system application, and as such, you are encouraged to develop such a system to address managerial issues you face at your workplace. In this project, you should identify an application in your workplace and develop a database system for it. If you are not able to find a proper application related to your work, you should come and talk to me before you choose anything else.

The project has 2 phases.

**Phase 1: Database design**

1. Pick an application, describe the application.
2. Why a database is needed for this application?
3. Draw Entity-Relationship diagrams for the application. Indicate the assumptions and constraints of the ER diagram. Convert the ER diagram to relational tables. Discuss the possible problems of the design.

Please turn in a 2-3 page report for this phase.

**Phase 2: Implementation in Microsoft Access.**

1. Properly refine your phase 1 according to my suggestions. You are allowed to make other changes to phase 1 if desirable.
2. Implement the tables in Microsoft Access.
3. Populate the tables.
4. Each group should write 5 queries. For each query, you should explain what business intelligence can be derived. Please write your 5 most insightful queries.

After you complete Phase 2, please submit your final project report. In the final report you turn in, you should clearly state the background of the application, the business problem you are addressing, the technical challenges you encountered, the design, the queries, and the potential uses of the database. The focus of the report should be on the business intelligence you can derive from your queries. For each query, please elaborate the story behind it.
When you submit the final report, please submit the Access file together with the Word file. Each group should only submit one copy of their report.

**Option 2 (Using data mining methods to build business intelligence):**

Each group identifies an application, and locates a relevant data set (you can acquire the data set from a company or from the Internet), then further comes up with interesting questions which can be answered based on the data set using data mining techniques learned in class. Finally, you should perform data analysis on the data set and report results.

This option is intended to provide you with valuable hands on experience in designing and implementing a real world data mining application, and as such, you are encouraged to be involved in the entire data mining process including 1) find a problem/application that interest you, 2) manage to get the data by yourself, 3) come up with questions that are important to your problem/application, 4) use the techniques you learned in class to answer those questions, 5) search for interesting patterns and models from the results, and 6) evaluate your results.

**Phase 1 report**

In the report you submit, please include the following information:
1) Description of the problem/application
2) Description of the data set, names and description of the attributes
3) Questions you want to address using data mining techniques
4) The business value of your planned analysis

**Phase 2: Turn in the final project report**

The deliverable will be a report documenting data preparation, techniques used, models produced, and evaluation of the models.

When writing your final report, please provide as much details as possible about your implementation and solution. When you submit your final report, please also include other files you want me to look at.

Your final report will be evaluated by the intensity of your analysis, creativity of your approach, interpretation of your results, and the business insights.

You might encounter a lot of problems when you start to process the data and build models using the software, so please start early and ask me for advice when you have difficulties.