Software Engineering Design I
Team-Project: Client-Server Resource Acquisition System
(Winter 2015)

Design a client-server system that allows users to access a database of resources such as magazines, newspapers, and journal articles from which they can potentially find articles relevant to their needs. The resources can be browsed/searched on various criteria such as alphabetically, by subject, title, author, date of publication, journal/conference name, etc. The database should at least contain 150 different resources. Two classes of users will use this system: system administrator and general users. The system administrator will have certain access privileges that the general users don't.

The general users of the system use a client program to access the database located on a server machine. The communication link between the client and server must be implemented using **Socket programming.** TCP sockets will be used, because TCP takes care of fragmentation and reassembly for long messages. Reliable delivery is also obtained for free using TCP sockets. The server must continually detect requests from client applications, process the requests, and respond by returning the requested information (if any) to the client. A GUI must be designed to enable a user to place various requests described above and to display responses.

Major requirements:
- A user must have the ability to search for resources by providing one or more keywords.
- A User must be able to filter results of a keyword search by one or more attributes.
- A User must be able to sort results of a keyword search by a single attribute.
- A User must be able to browse the database by alphabetical order, by subject, author's name, date of publication, journal/conference name, etc.
- The system must contain a tutorial or help on how to search and use the system.
- The system administrator must authenticate to access privileged functionality.
- The system administrator must have the ability to log into the system in order to access privileged functionality.
- The system administrator must have the ability to add a new resource, modify attributes of any existing resource, and delete any existing resource.
- The system administrator must have the ability to add a new attribute and to delete existing attributes common to any resource.
- The system administrator must have the ability to export all resources and relevant data to an arbitrary file.
- Users must log in to the system to access the resources.
- The server must handle multiple concurrent clients (connections) and respond to each and every client requesting service.
- Users must interact with the system through a GUI that enables them to place various requests described above and to display responses.
- You must use Object Oriented design using C++.
- You must ensure the robustness of your software product: the product must handle intentionally erroneous input data without falling apart (crashing).