CS7700 Formal Project Proposal

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CS7700 Advanced Database Systems
Instructor: Eric Saunders
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Table of Contents

CS7700 Formal Project Proposal

1. Motivation

This course requires either a thirty page research paper or a database application. I have chosen the database application for two reasons. First, I am a hands-on learner and the process of developing a database application appeals to me. Second, I the technology I will be using mirrors that of the technology I am using at work, and therefore anything I learn at work will be applicable to this class and vice versa.

It was stated on the May 12th news item on Pilot that "the application must revolve around a database" [1] (hence "database application"). It will solve "a fictious[sic] or real-world issue." [1] The application will be demonstrated to the teacher, and potentially to the class if time allows, at some future date but before the end of the semester. The application will "display characteristics at the graduate level and include a User's Manual." [1]

2. General Description of the Chosen Problem

The database application I would like to make is a family tree. I currently have family tree software (Family Tree Maker 2005) but it is out of date [2] and uses what appears to be a proprietary file type (file extension FTW). Although I can run the software and see at least a subset of what information it is storing, I have no idea what the schema, if any, looks like. There are also things about the software does not do that I would like to do.

A relational database is a natural solution for a family tree, as a family tree itself is highly dependent on relationships. A family tree, however, is more than just a list of people and the relationships among them. Other data that may be stored in a family tree may include, but not be limited to, pictures, dates and names of significant events (such as marriages, baptisms, bar mitzvahs, etc.), and sources (such as birth certificates, census records, marriage records, etc).

3. Technology to be Used

Most of the software I plan on using mirrors the software I am using on the contract I am working on at work. The main difference between the software I am using at work and the software I will be using on this project is that I may use new versions of the software on this project. Also, I may or may not upgrade the software over the course of working on this project. It depends on if a new version if available, if the newer version has a bug fix or new feature I find necessary or desirable, and if I feel it is worth the time and effort to actually upgrade.

The software I plan on using for this project includes the following Java libraries and technologies:

- Java Server Faces (JSF) 2.2
- PrimeFaces 5.0
- ojdb7.jar
- Java Development Kit (JDK) 1.8
- Apache Tomcat 8.0.15.0

The database I plan on using is:

- Oracle Database 11g Express Edition

The development tools I plan on using are:

- GitHub for Windows 2.14.5
- NetBeans IDE 8.0.2
- Oracle SQL Developer 4.1.0.19

Additionally I have created an account on GitHub and am storing / backing up my source code there in a Git repository as well. I have already committed files to the GitHub server, and they are available at https://github.com/hendrixjoseph/FamilyTree.

CS7700 Formal Project Proposal

Addition I have created release version 0.1.0, which is available at https://github.com/hendrixjoseph/FamilyTree/releases/tag/v0.1.0.

Most of the files in the repository are the java and xhtml files for the client / server, sql files that serve as backup for the database, .gitignore, README.me, and some xml files.

Most, if not all development will occur on my personal laptop. It is an HP Envy 17 Notebook PC with an Intel® Core™ i7-4710HQ CPU at 2.5 GHz with 12 GB RAM. It is currently running the 64 bit version of Windows 7 Professional Service Pack 1.

This document was created in Microsoft Word 2013.

CS7700 Formal Project Proposal

4. Database for Version 0.1.0

Version 0.1.0 has a very simple, not normalized schema. It consists of a single table PERSON with a primary key without a sequence and no foreign keys. The schema is described in *Figure 1*.
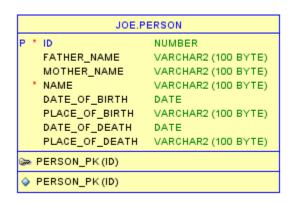
```
                JOE.PERSON
P * ID                  NUMBER
    FATHER_NAME         VARCHAR2 (100 BYTE)
    MOTHER_NAME         VARCHAR2 (100 BYTE)
  * NAME                VARCHAR2 (100 BYTE)
    DATE_OF_BIRTH       DATE
    PLACE_OF_BIRTH      VARCHAR2 (100 BYTE)
    DATE_OF_DEATH       DATE
    PLACE_OF_DEATH      VARCHAR2 (100 BYTE)

  PERSON_PK (ID)

  PERSON_PK (ID)
```

Figure 4.1

One sample person was put into the database as well. The person is shown in *Figure 2*.

ID	FATHER_NAME	MOTHER_NAME	NAME	DATE_OF_BIRTH	PLACE_OF_BIRTH	DATE_OF_DEATH	PLACE_OF_DEATH
1	Samuel Thoroman	Cynthiann McDonald Reynolds	William Zenos Thoroman	March 4, 1827	Ohio	January 29, 1900	Jacksonville, Ohio

Figure 4.2

Over the course of the semester the project database will be normalized. For instance, FATHER_NAME and MOTHER_NAME might become FATHER_ID and MOTHER_ID, and each will be a foreign key to the ID field of another record in the PERSON table. Also, PLACE_OF_BIRTH and PLACE_OF_DEATH could become numeric foreign keys to a PLACE table.

CS7700 Formal Project Proposal

5. Deliverables

All deliverables will be submitted before the end of the semester at a time of the instructor's choosing. Most likely deliverables that are files will be submitted via Pilot.

5.1   All Java, SQL, and XHMTL code (which will also available on the GitHub site)
    5.1.1 Javadoc for the Java code
    5.1.2 Schema diagrams, perhaps similar to *Figure 4.1*.
5.2   User Manual explaining how to use the application
5.3   Final Report, containing, but not limited to:
    5.3.1 Normalization process
    5.3.2 Difficulties faced
    5.3.3 What software I upgraded, if any, and why
    5.3.4 What software I decided not to use, if any, and why
    5.3.5 Any software, code, or other resource I used that is not mine that is not listed in this document, how I used it, why I used it, and where I got it from (most likely will be a website)
5.4   Demonstration of application to teacher, and perhaps the class too

6. References

1. Saunders, Eric. News - Projects. *Pilot CS-7700-C01 - Adv. Database Systems.* [Online] May 12, 2015. No direct url; account required to access. http://pilot.wright.edu.

2. Ancestry.com FTM version history. *Wikipedia, The Free Encyclopedia.* [Online] June 13, 2015. https://en.wikipedia.org/w/index.php?title=Ancestry.com&oldid=666779381#FTM_version_history.