Lab 4: Software Design and Data Upload

Due date: Monday, May 13, 11:59pm.

This is a **team lab**. Each group submits one set of deliverables.

Lab Overview

This assignment pursues the following goals:

1. **Final conceptual and logical design.** You will finalize the conceptual and logical design of the NOSES database to take into account comments from the instrutor, as well as any new information from the customer.

2. **Software Design.** You will develop a detailed list of use cases for the NOSES web application. Following your list of use cases, you will build a collection of wireframes for the NOSES web application, and demonstrate them to the customer.

3. **Extract-Transfer-Load (ETL).** You will build the process for uploading the data the customer has shared with us into your version of the NOSES database.

Finalizing Conceptual and Logical Database Models

On Monday, April 29 you will receive instructor's comments to your revised conceptual design and to your logical database model. In addition, on May 1, each team will meet with our customer, and will have the opportunity to discuss their data model (carefully - make sure you discuss it at the right level of abstraction to allow Dr. Liwanag and her students to provide you the necessary information).

Your goal is to finalize the logical model of your database - which, in turn, may yield additional modification to the conceptual model (*please make sure* *that the final conceptual model you submit does correspond properly to the revised logical model you develop as part of this lab*).

Data and Data Upload

In support of this lab, and your futher software development activities, we have released two years worth of elephant seal observations collected by Dr. Liwanag and her associates. The two Excel spreadsheets contain a lot of worksheets. Some of the worksheets contain the observation data that needs to be placed into the database. Some of the worksheets contain data that is not relevant to the course project (e.g., any data related to seal harems is outside of the scope of the course project, although future versions of NOSES may incorporate it). Some other worksheets contain additional information (beach names, tag colors, etc) that can and should be placed into various tables in the database.

Extract from the Excel spreadsheets the information that needs to be placed into the database. Following this, complete the Extract-Transfer-Load (ETL) process for the input data. You can use whatever means you like to place the data into the database, provided you do the following:

- Proper Loading: the data needs to be properly mapped to the NOSES database your built - each relevant data element from the spreadsheets must be properly placed in the right table/tables.
- Automation: you should expect that batch uploading of observation data will use Excel spreadsheets with similar format (at least for the worksheets that store observation data). Therefore, it is highly recommended that as part of your ETL process you develop some code that can be later reused for the batch update use case that *each team should have in the list of use cases.*

Software Design

Because NOSES is a web application, our software design concentrates on two aspects: (a) use cases and (b) wireframes.

Use Cases. The documentation provided by the customer lists a number of important use cases (see Section called Functionality). At the same time, the (a) these use cases are expressed in a rather informal way, and (b) the list of use cases is incomplete.

Your goal is to build a full set of use cases that describes the operation of the NOSES web application. This set shall contain both use cases supporting routine operation of the web application (login, logout, browsing of important data, administrative activities) as well as detailed use cases built on top of the functionality requested by Dr. Liwanag: the interactive and batch entry of new observation, search for a specific seal, data merging, and reporting.

Web Application Wireframes. Following the development of the comprehensive set of use cases, build a collection of wireframes describing the general look and feel of your version of NOSES and mapping the use cases to the specific paths through your wireframe collection.

You can choose from a number of different ways to build wireframes: from general purpose or special-purpose design software (anything from Google Slides/Powerpoint to Balsamic, e.g.) to actual web page "skeletons" built in the web development framework of your choice.

On May 1 during the entire two-hour class period, as well as possibly on May 6 and 10 Dr. Liwanag and some of her students will join you. Use this time to demonstrate your wireframes, and discuss the convenience of use, as well as any other design aspects.

Deliverables

By the end of the day, Monday, April 29 each team shall send an email to dekhtyar@calpoly.edu specifying the exact technologies it is planning to use for NOSES. We require the use of MySQL as the relational database back end for the NOSES database, but the rest of your application stack is up to you. The email shall describe the application stack, and mention any software that you will need to install on the virtual machine given to you.

The remainder of deliverables are all due Monday, May 13 before midnight. All of these deliverables (except for the code) shall be placed in a single Googledocs directory, and that directory shall be shared with `dekhtyar@gmail.com`. Please note:

- **Please, share only the directory** with the instructor. No need to share individual files.
- **Please, make sure that the team name/names of all students are available in each individual document** submitted.

Below is the list of all deliverables.

Old hardcopy deliverables. Submit the entire trail of your project documentation from Labs 2 and 3. Hand them to the instructor during May 13 lab period. This will yield a numeric grade for your Lab 2 and Lab 3 performance.

ChangeLog. Create a new changelog documenting any changes in the database design (both conceptual and logical model) from Lab 3 submission.

Conceptual Design. Your final conceptual design document. **Please include the E-R diagram directly into the document**. This will make it easy for me to print your design.

Logical Design. Include in your Lab 4 directory both the revised logical design document, and the final version of the `DB-create.sql` file.

Use Cases. Your use cases submission shall be a text document with the list of all use cases (organized in some **meaningful** way), and their detailed descriptions.

Wireframes. Your wireframe images shall be placed into a single document, and accompanied by some commentary explaining the transitions between individual views, and the mapping of the wireframes to the use cases. (Even if your wireframe is already a set of web pages, please take screenshots, place them into the document and add commentary).

All of the deliverables mentioned above shall be placed in the Lab4 directory shared with the instructor.

In addition to this, each team shall share with the instructor (github user `dekhtyar`) its code repository, and provide some comments (a README file, for example) explaining the ETL code.

Demo. Each team will demonstrate the operation of the data loading functions during the Monday, May 13 lab period. Be ready to show (a) an empty database, (b)the operation of your ETL process, (c) the filled database after information was added to it.

Good Luck!