# Enterprise Model Project

# Introduction

Over the course of the term, you will be designing and implementing a database as described in appendix A. This project is broken into a number of activities as shown in table 1. Each activity will produce one *section* of the project. The results of each activity are grouped into five *activities*; the due date for each activity is listed in appendix A.

# Table 1. Project activities.

|  |
| --- |
| **Project Activities** |
| Describe the enterprise |
| Define the environment |
| Develop semantic data model |
| Define the database and formulate queries |
| Consider database integrity and security |
| Implement the database |
| Complete peer reviews |
| Demo database build, load, queries for instructor |
| Reflect: Lessons learned |
| Complete report and files containing design, tables, queries, traces |

Students are expected to turn in the document for every activity online, as specified by the instructor. In addition, the final completed document is to be submitted in hard copy organized by the sections of the project, as described below. A detailed description of each section follows.

There will be nine sections in all.

Pages of the project report are to be numbered consecutively within each section. For example, the first page of the enterprise description (section I) should be numbered I-1, the second page of the enterprise description should be numbered I-2, and the *n*th page of the description should be I-*n*. If the design section (section III) spans 10 pages they should be numbered III-1 through III-10.

Label all tables and figures. Table labels appear *before* the table, centered. Figure labels appear *after* the figure, centered. Observe the examples in this document and follow a similar format.

***As each interim assignment is returned, you are expected to incorporate into your next version any corrections, modifications, or additions which I have noted on your project.***  The revised work should be submitted to the same assignment to which it was originally submitted. The previously submitted assignment, with corrections/modifications/additions indicated and all rubrics, comments, and uploaded review documents should be retained in that assignment link, available for future reference. The final report should contain one section for each activity, as well as the title page, table of contents, copy of the assignment with supplements, and historical section. The last should contain the previous submissions that have since been revised, as well as any notes you have made along the way to help you complete the project. These would include, but not be limited to, design tradeoffs and bibliographical references.

Table 2. Project report sections.

|  |  |  |
| --- | --- | --- |
| **Part of Activity #** | **Belongs in Section #** | **Section Contents** |
| 3 | i. | Title page [see sample in appendix C] |
| 3+ | ii. | Table of Contents  - Three levels of headings with page numbers - Includes table of contents, table of figures, table of tables |
| all |  | Evaluations – maintained online |
| 1 | I. | Description of the EnterpriseI.1 DescriptionI.2 Queries |
| 2 | II. | Definition of the EnvironmentII.1. Input and report forms. A list of input and report forms, with itemized data items.II.2. Assumptions. List of assumptions for your enterprise database.II.3. User-oriented data dictionary.II.4. Cross-reference table. |
| 4 | III. | Semantic Data ModelIII.1 Logical model of the enterpriseIII.1.1 List of entities and attributes.III.1.2 List of relationships and attributes.III.1.3 Entity-Relationship diagram of the enterprise.III.2 Conceptual model of the enterprise.III.3 Table dictionary.III.4 Attribute dictionary. |
| 6 | IV. | Database Design and Query DefinitionIV.1 Database Definition. SQL DDL for your database objects.IV.2 Database Queries. English version of 10+ database queries, and the SQL DML for each database query IV.3 Design Limitations. Discussion of the limitations of your design. |
| 7 | V. | Database Integrity and SecurityV.1 Functional Dependencies. A list of the functional dependencies that hold on your database.V.2. Adjustments for Normalization. An explanation of the changes needed to normalize your database.V.3. Integrity and Security. A list (in English) of the integrity and security constraints which are to hold on your database. |
| 9 | VI. | Implementation NotesVI.1. Indices. A list of the indices used by your database, with a justification for each.VI.2. Data. The data used to populate your database.VI.3. Query Trace. A trace of the execution of each of your queries.VI.4. Implementation Assessment. An assessment of how smoothly your implementation went. |
| 4,5,8,10 | VII. | Peer Reviews |
| 11 | VIII. | Demo Evaluation |
| 12 | IX. | Lessons Learned |
| 13 | Report+Code | Final Delivery |

As each interim assignment is returned, you are expected to incorporate into your next version any corrections, modifications, or additions which I have noted on your project. The previous assignment, with corrections/modifications/additions indicated, should be included in the "history" section, and submitted each step of the way, along with the revised and augmented work. Your final report should contain a title page, table of contents, table of figures, table of tables, and one section for each activity. The last should contain the previous submissions that have since been revised, as well as any notes you have made along the way to help you complete the project. These would include, but not be limited to, design tradeoffs and bibliographical references.

Beginning with activity three, each activity document should include a table of contents (including table of figures and table of tables). The table of contents should include at least the top three levels of headings and relevant page numbers.

The remainder of this document issues a caveat to developers, then describes the assignments associated with each activity. Appendix A provides a project problem description. Appendix B includes a template that can be used to develop your project report. Appendix C includes a sample title page. A copy of the review signoff sheet required in section VII can be found in Appendix D.

You are expected to be familiar with the required contents, format, and due date of each section of your project report.

# Notes to the Wise

# Plan ahead and work on the project consistently all term long. This project cannot be completed in a single night. It is difficult to complete any single task in a single night, let alone an entire activity.

Remember the five *P*s: *P*roper *p*lanning *p*revents *p*oor *p*erformance.

Doing a good job on the project requires spending 8 to10 hr/week on the course.

The activities in this project make sense and guide you through the development process if you follow them in order. Each offers a different perspective on the project. Some steps will appear redundant otherwise. For best results, complete each activity in sequence, and revise the related deliverables with each subsequent activity.

# Activity 1: Describe the enterprise.

# Turn in: Section I. Description of the Enterprise: Textual description of your enterprise.

Write a textual description of the enterprise (500 words). Describe the purpose of the enterprise, the people involved, and the information processing performed. Include descriptions of the records that need to be maintained, the entities to which they relate, and the relationships that exist among the entities. At this point, the goal is to understand the enterprise that you will be modeling. This description will evolve, and, perhaps, become more detailed, over the course of the project. *Do not include any "techtalk" in your description!* That is, avoid database-specific terms such as entity, relationship, or cardinality. Gear the description to a non-technical manager. Use the description in Appendix A (if provided) as a starting point, tailoring it to your specific enterprise model and adding details and questions/queries as needed.

# Activity 2: Define the environment.

Turn in: Section II. Definition of the Environment

 Section II.1. Input and report forms: List of input and report forms, with

 itemized data items.

 Section II.2. Assumptions: List of assumptions for your enterprise database.

 Section II.3 User-oriented data dictionary.

 Section II.4 Cross-reference table.

 Section I (revised as needed)

In this step you will take a closer look at the environment in which your database will exist. Assume that you are having or have had a series of meetings and interviews with users of the proposed system, to determine their data needs and preferences. In real life, you will be working with the end users from day one, to ensure that the final product will meet their needs, as well as to gain their support for and confidence in the project.

First, consider how information will be put into the system, and retrieved from it. If you were actually working with an enterprise to design and implement an information processing system, you would have to identify and write out the format for each input document and database report, and for each input and output screen for every routine transaction to be performed against the database. For example, suppose we were developing a DBMS for a software consulting firm. One form we might use would be the consultant application form shown in figure 1. A screen listing potential consultants for a job appears in figure 2. In a large enterprise, the data analysis or business systems analysis staff would most likely perform this activity.

*Without actually designing the layout of the input/output screens and database reports*, carefully think through daily operations. *Draw up a list of the input form and report forms, and itemize the data values utilized on each.* For example, corresponding to figure 1 we would have the list shown in figure 3.

Next, ***write out a list of assumptions* for your environment** that you would have picked up during your customer meetings. You will add to this list as the project progresses. Some assumptions from the consulting enterprise are shown in figure 4.This example is by no means exhaustive.

Now, to help refine your system, you develop two documents:

• A *user-oriented data dictionary*, consisting of an alphabetical list of every data item referenced in any document, report, or routine transaction and an informal definition for each item. The dictionary should be created in table form, with two columns: Datum, and Informal Definition. An example of the dictionary can be found in table 3.

Users will reference this document independently from accessing the database itself to better understand the enterprise semantics and write appropriate queries and database programs.

SoftWare Consultants, Inc.

Application Form

Date of Application \_\_\_\_\_\_\_\_\_\_\_\_\_

Name \_\_\_\_\_\_\_\_\_\_\_\_\_

Address \_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone \_\_\_\_\_\_\_\_\_\_\_\_\_ Email Fax

Social Security Number \_\_\_\_\_\_\_\_\_\_\_\_\_

Date of Birth\* \_\_\_\_\_\_\_\_\_\_\_\_\_ Sex\*

Skills -- For each of the following, indicate your experience level:

 None Some Extensive

 C

 C++

 Windows

 Object-Oriented Programming

 Relational DBMS

 CLIPS

 Lisp

Date Available to Work: \_\_\_\_\_\_\_\_\_\_\_\_\_

Restrictions on Work Dates: \_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_

To be filled in by interviewer:

Date Hired \_\_\_\_\_\_\_\_\_\_\_\_\_ Reason not hired

\* SoftWare Consultants, Inc. does not discriminate of the basis of age or sex of applicant.

Figure 1. Input form: Consultant application.

Potential Consultants

1. The following consultant is eligible for the job.

2. To see other eligible consultants, press enter until the message "No others are eligible" is displayed.

 \_\_\_\_\_\_\_\_\_\_\_\_\_

Employee ID \_\_\_\_\_\_\_\_\_\_\_\_\_ Social Security Number

Name \_\_\_\_\_\_\_\_\_\_\_\_\_

Address \_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone \_\_\_\_\_\_\_\_\_\_\_\_\_ Email Fax

Rating \_\_\_\_\_\_\_\_\_\_\_\_\_

Last Date Worked \_\_\_\_\_\_\_\_\_\_\_\_\_ Sex\*

Skill Levels:

 C CLIPS Linux

 C++ Lisp Windows

 Object-Oriented Programming Relational DBMS

Figure 2. Output Screen: Potential consultants for a job.

• A *cross-reference table* showing which items appear on the various documents, reports, or transactions you have already identified. Table 4 shows how the data would map to the documents, reports, and transactions of the consulting enterprise.

 This document allows us to trace requirements to data items, forms, reports, and database transactions. If we make a change to any of these artifacts, this document will enable us to understand the impact the change will have on other artifacts.

SoftWare Consultants, Inc. -- Application Form

• Date of Application

• Name

• Address

• Telephone

• Email

• Fax

• Social Security Number

• Date of Birth

• Sex

• Skill experience level (None/Some/Extensive)

- C

- C++

- Windows

- Object-Oriented Programming

- Relational DBMS

- CLIPS

- Lisp

• Date Available to Work

• Restrictions on Work Dates

• Date Hired

• Reason not hired

Figure 3. List corresponding to the consultant application input form of figure 1.

1. Prospective consultants fill out an application form, and are interviewed by both a regional consulting manager and a current consultant to ascertain interests of consultants and confirm their skill levels.

2. Consultants are assigned to only one job at a time.

3. Both skill level and requirements of the job determine a consultant's wage.

4. Clients are charged a daily rate and are billed weekly.

5. Assignments can be from one day to several months duration.

6. A consultant might work at the customer site, an office of SoftWare Consultants, Inc., or at the consultant's home, depending upon the requirements of the job.

Figure 4 Some assumptions for the SoftWare Consultants, Inc., enterprise.

Table 3. User-oriented data dictionary.

|  |  |
| --- | --- |
| **Datum[[1]](#footnote-1)** | **Information Definition** |
| consultantName | The name of a consultant in the form <last>, <first and rest>.Example: Doe, Jane Marie Smith |
| consultantAddress | The address of a consultant. Includes street number, street name, unit number, city, state, postal code if relevant, and country, if outside the U.S.Example A: Example B:123 N. Main Street, Suite 14 O’Donnell RoadCentral, CA 99999 Doolan, County Clare, Ireland |
| consultantPhone | The telephone number of a consultant. Includes area code (if US) or country code and city code (if not US) and phone number. |
| potentialConsultantName | The name of a prospective consultant. Refer to *conName* for format. |
| potentialConsultantAddress | The address of a prospective consultant. Refer to *conAddr* for format. |
| potentialConsultantPhone | The telephone number of a prospective consultant. Refer to conPhone for format. |
| software\_skill | Software skill possessed by a person or required by a job. Examples:C#, LISP, CLIPS, Java, Linux, Windows, relational DBMS |
| software\_skill\_level | Level of expertise of a skill either possessed by a consultant or required by a project. Allowed values: *None, some, extensive.*  |
| ... | ... |

Table 4. Mapping of data to forms and transactions.

|  |  |
| --- | --- |
| **Datum** | **Form or screen**  |
|  | Prospective Consultant Application | Prospective ClientApplication | Client Information | Consultant | ... |  |  |  |  |
| consultantName |  |  |  | X |  |  |  |  |  |
| consultantAddress |  |  |  | X |  |  |  |  |  |
| consultantPhone |  |  |  | X |  |  |  |  |  |
| potentialConsultantName | X |  |  |  |  |  |  |  |  |
| potentialConsultantAddress | X |  |  |  |  |  |  |  |  |
| potentialConsultantPhone | X |  |  |  |  |  |  |  |  |
| software\_skill | X |  |  | X |  |  |  |  |  |
| software\_skill\_level | X |  |  | X |  |  |  |  |  |
| . . .  |  |  |  |  |  |  |  |  | . . . |

# Activity 3: Peer Review #1

Turn in: Peer Review #1

*Team with another student to review the enterprise definition.* Review Sign-off Sheets are found in appendix D. Have the other student evaluate the description and definition documents and record review notes using the appropriate review sheet. Both the student whose work is reviewed and the student performing the review need to submit a copy of the review *and* include the review in their own reports. The comment section should reflect the reviewer’s mastery of course content, that is, the reviewer is expected to have write something more meaningful than "Looks okay to me." Students be graded on the quality of the review and comments that provided to the peer, and will receive a grade for having someone complete the peer review. Note that four copies each peer review are needed – one for the report of the student receiving the review, one for the report of the student performing the review, and two hardcopies for the instructor, one submitted by reviewer and one submitted by reviewee.

# Activity 4: Develop logical and conceptual models of your enterprise.

Turn in: Title Page

 Table of Contents (for all sections complete)

 Section III. Semantic Data Model

 Section III.1. Logical model of the enterprise.

 III.1.1. List of entities and attributes.

 III.1.2. List of relationships and attributes.

 III.1.3. Entity-relationship diagram of the enterprise.

 Section III.2. Conceptual model of the enterprise.

 Section III.3. Table dictionary.

 Section III.4. Attribute dictionary.

 Sections I-II (revised as needed)

Now you are going to develop both the logical and conceptual models of your enterprise. First, you develop a logical or semantic model of your enterprise. This is a three step process:

• *Make a list of all entities and their associated attributes.*

 This may take several attempts, and different designers will arrive at different solutions. In identifying entities, you will examine the data dictionary you developed in Section V.3. Think about the enterprise, and enumerate the persons, places, events, objects, or concepts that you need to keep information about. The original data dictionary may have some items that you need not store in the database. They can be dropped from the list of attributes.

• *Make a list of relationships to be represented and any descriptive attributes for them.*

 At this point you may decide not to store some of the items from the original data dictionary. For example, information such as *payroll totals* might only be needed for a periodic payroll report. It might make more sense to calculate it when needed, than to explicitly store it in the database. Document any changes you make, and retain this information in the history section.

 For the SoftWare Consultants, Inc., example we might have the entity sets:

**CONSULTANT[[2]](#footnote-2)**: consultantName, consultantPhone, consultantAddress, consultantID, SS#, DoB

**SKILLS**: software\_skill

 and the relationship set:

**CONSULTANT\_SKILLS**: consultantID, software\_skill, software\_skill\_level

• *Draw an E-R diagram to represent the enterprise.*

 Be sure to identify relationship cardinalities, and any weak entity sets. Use generalization and aggregation as necessary to express relationships.

 This document provides a picture of the entire enterprise model. People working with the database will use the ERD to navigate a database the way we use a road map to navigate through our cities and states.

Pointers:

• The textual description of the enterprise you are modeling should reflect the semantics of your entity-relationship diagram *accurately*, including entity sets, relationship sets, cardinalities, and attributes.

• Each entity set should represent a single concept -- don't confuse *order* and *product*, for instance, or *order* and *customer*.

• Explicitly represent relationships between/among entity sets in the E-R diagram.

• Each attribute should have a unique name!

• Indicate the primary key (PK) for each entity set.

• Indicate which attributes are candidate keys (CK) in each attribute. Remember that the PK is always a CK!

• Do not include foreign keys in the ERD. They are implicit in the relationships represented in the diagram. If you include FKs in spite of this request, you must explicitly identify each foreign key attribute as a foreign key in each relation and indicate its source or parent table.

• Indicate each discriminator of a weak set, where such a discriminating attribute exists.

Next, *produce a conceptual model of your enterprise*, by reducing the E-R diagram to tables in the relational model, as we did in class. You can do this using either the

*table-name-R*(*attribute-1*, ..., *attribute-n*)

CK: *attribute-1*, *attribute-i*

FK: *attribute-j* references *table-name-S.attribute-k*

notation, or the

|  |  |  |
| --- | --- | --- |
|  | *table-name-R* |  |
| *attribute-1* | *...* | *attribute-n* |
| PK |  |  |
| CK |  | CK |
|  |  | FKreferences *table-name-S.attribute-k* |

notation. Be sure to indicate in each table which attributes participate in the primary key, which attributes are parts of candidate keys, and which attributes are foreign keys. Remember to indicate the source of each foreign key.

The final steps of this activity are to create a *revised* data dictionary in two parts. The first part, the "table dictionary", will consist of *a three-column table* listing *each table* to be included in the database, the *attributes* that are in the table, and *an informal definition of the table*. This will provide an easy reference guide to your database. The second part of the data dictionary, the "attribute dictionary", will consist of a revised version of the user-oriented data dictionary described in section V.3 above. *To that document, add a column specifying the table in which each attribute is used*. If an attribute has been renamed and used as a foreign key in a table, add it to the attribute dictionary list, specifying the table in which the renamed version is used. In the definition portion of the entry, indicate the attribute which the foreign key attribute references.

# Activity 5: Peer Review #2

Turn in: Peer Review #2

*Team with another student to review designs and schema.* Review Sign-off Sheets are found in appendix D. Have the other student evaluate the design and record review notes using the appropriate review sheet. Both the student whose work is reviewed and the student performing the review need to submit a copy of the review *and* include the review in their own reports. The comment section should reflect the reviewer’s mastery of course content, that is, the reviewer is expected to have write something more meaningful than "Looks okay to me." Students be graded on the quality of the review and comments that provided to the peer, and will receive a grade for having someone complete the peer review. Note that four copies each peer review are needed – one for the report of the student receiving the review, one for the report of the student performing the review, and two hardcopies for the instructor, one submitted by reviewer and one submitted by reviewee.

# Activity 6: Define the database and formulate queries.

Turn in: Title Page

 Table of Contents (updated)

Section IV. Database Design and Query Definition

 Section IV.1. Database Definition: SQL DDL for your database objects.

 Section IV.2. English version of 10+ database queries, and the

 SQL DML for each database query.

 Section IV.3. Design Limitations: Discussion of the limitations of your

 design.

 Sections I-III (revised as needed)

Write the SQL DDL statements to create all tables needed to implement the design completed in Activity 3. Include relevant inetgrity constraints for foreign keys, that is, for each foreign key declared, specify in the DDL the action that should be taken if the related valued in the parent table is deleted or updated. Use ALTER TABLE statements to include integrity constraints rather than declaring them in the DDL for each table. Include your DDL in one or more .sql files, with an accompanying database build file that will load the SQL statements.

*Compose English language queries that are needed to process at least ten (10) nonroutine requests for information* from the database just created. These ten queries should be OLAP-oriented, rather than OLTP-oriented. For each, write the request in English, followed by the corresponding SQL command. At least 5 of these should be "difficult" queries, that is, queries involving multiple tables and/or complex operations on a single table.

*Team with another student to review designs, schemes.* A Review Sign-off Sheet is found in appendix D. Have the other student evaluate the design and record review notes using this sheet. Both the student whose work is reviewed and the student performing the review need to submit a copy of the review *and* include the review in their own reports. The comment section should have something more meaningful than "Looks OK to me." Students be graded on the quality of the review and comments that provided to the peer, and will receive a grade for having someone complete the peer review. Note that four copies each peer review are needed – one for the report of the student receiving the review, one for the report of the student performing the review, and two hardcopies for the instructor, one submitted by reviewer and one submitted by reviewee.

*Identify the limitations of your design.* Include a discussion of the kinds of information which are difficult to extract from your database, due to its content and structure and/or due to the limitations of SQL. Propose modifications to your enterprise model or the query language which would make it easier to extract the information.

# Activity 7: Consider database integrity and security.

Turn in: Title Page

 Table of Contents (updated)

 Section V. Database Integrity and Security

 Section V.1. Functional Dependencies: A list of the functional dependencies that hold on your database.

 Section V.2. Adjustments for Normalization: An explanation of the

 changes needed to normalize your database.

 Section V.3. Integrity and Security: A list (in English) of the integrity and

 security constraints which are to hold on your database.

 Sections I-IV (revised as needed)

At this point you need to concern yourself with integrity and security issues related to your database. First, let us consider normalization. This will be a two-step process:

• *Identify all of the functional dependencies that hold on the database.*

• *Normalize each relation* identified in the preceding activity. Be sure that every attribute listed in the first step above appears in at least one table. Then decide whether the table should be implemented in the highest normal form. If not, explain why.

*Modify your environment definition and cross-reference table* from activity 2 to reflect any changes resulting from the normalization process.

*Revise your table and attribute dictionaries* from section VI.3 and VI.4 as needed*.*

*Revise your entity-relationship diagram* as needed*.*

*List the integrity and security constraints* that should hold on your database. Consider how the use of foreign keys, assertions, triggers, and *grant* statements support integrity and security in your database. Your writeup should clearly identify classes of users and the privileges accorded to each. Justify each constraint employed. Identify and define any views required. Any views created need to be added to both parts of the data dictionary. Write the SQL statements needed to support these constraints, wherever possible. If SQL does not support integrity and security constraints which you would like to maintain on your DB, explain where it falls short, and how you can compensate for the shortcoming(s). (You can suggest application programs or extensions to SQL to shore up the constraint support mechanism.) Refer to the textbook for ideas.

# Activity 8: Peer Review #3

Turn in: Peer Review #3

*Team with another student to review designs and schema.* Review Sign-off Sheets are found in appendix D. Have the other student evaluate the design and record review notes using the appropriate review sheet. Both the student whose work is reviewed and the student performing the review need to submit a copy of the review *and* include the review in their own reports. The comment section should reflect the reviewer’s mastery of course content, that is, the reviewer is expected to have write something more meaningful than "Looks okay to me." Students be graded on the quality of the review and comments that provided to the peer, and will receive a grade for having someone complete the peer review. Note that four copies each peer review are needed – one for the report of the student receiving the review, one for the report of the student performing the review, and two hardcopies for the instructor, one submitted by reviewer and one submitted by reviewee.

# Activity 9: Implement the database.

Turn in: Title Page

 Table of Contents, updated

 Section VI. Implementation Notes

 Section VI.1. Indices: A list of the indices used by your database,

 with a justification for each.

 Section VI.2. Data: The data used to populate your database.

 Section VI.3. Query Trace: A trace of the execution of each of your queries.

 Section VI.4. Implementation Assessment: An assessment of how smoothly

 your implementation went.

 Sections I-V (revised as needed)

*Implement your database using Oracle or PostgresQL*. Make any needed adjustments to your DDL files. Indicate where in your database an index needs to be added, and explain why it should be added. Add the DDL to generate each index, as needed.

*Populate your database.* Create a file containing the *insert* statements needed to perform your initial data load.

*Implement, and test, and save each of the queries* developed in Activity 4. If possible, test your implementation on more than one DBMS, and describe the differences you encountered, if any. If you use ANSI standard SQL, your code should run on any ANSI-compliant DBMS.

Create a trace of the creation and load of your database and the test of each query, using the spool facility of your DBMS or a similar mechanism.

# Activity 10: Peer Review #4

Turn in: Peer Review #4

*Team with another student to review designs and schema.* Review Sign-off Sheets are found in appendix D. Have the other student evaluate the design and record review notes using the appropriate review sheet. Both the student whose work is reviewed and the student performing the review need to submit a copy of the review *and* include the review in their own reports. The comment section should reflect the reviewer’s mastery of course content, that is, the reviewer is expected to have write something more meaningful than "Looks okay to me." Students be graded on the quality of the review and comments that provided to the peer, and will receive a grade for having someone complete the peer review. Note that four copies each peer review are needed – one for the report of the student receiving the review, one for the report of the student performing the review, and two hardcopies for the instructor, one submitted by reviewer and one submitted by reviewee.

# Activity 11: Demo for Instructor

Turn in: Section VIII. Instructor Demo Evaluation.

# Activity 12: Lessons learned.

Turn in: Section IX. Lessons Learned.

 Sections I-VIII (revised as needed)

*Describe what you learned during the course of this project.* This discussion should be about 500 words in length. Your lessons learned section should at a minimum address the following questions: What would you do differently next time? What database resources should you have used, or do you wish had been available? How many hours did you put in? How useful was the project in helping you learn the course material. What would facilitated completing the project? How do you like ORACLE or the DBMS engine you used on the project?

# Final Activity 13: Deliver completed project

Turn in: Code and documentation

 Upload a zip file to the final assignment containing three folders:

 CODE:

* README file
* SQL files, i.e., source code, build files, data files, query files
* PDF showing a trace of database build and load, as well as query processing

 DESIGN:

* PDF of the final ER diagram
* .dml file containing the final ER/Studio ER diagram

 REPORT:

* PDF of the complete project report as a single file, as described below

 Completed report

 hard copy, including title page, table of contents, table of figures, and complete project report including a printed copy of the final ER diagram, SQL, English queries and SQL implementation, database build and query trace, and an inventory the files included in the zip file, and the lessons learned reflection.

Demo

One-on-one demo with instructor loading SQL build and data files, then running the query script and comparing the results to those included in the project report. *This needs to be scheduled with the instructor one week ahead.*

# Note:

 Some of the ideas for this project were taken from:

Ricardo, Catherine M. *Database Systems: Principles, design, and implementation.* New York, Macmillan, 1990. 0-02-399665-X

1. Avoid using all capitals for your attribute names; it is easier to read names with mixed capitalization or lowercase with underscores ( \_ ) between words. [↑](#footnote-ref-1)
2. Entity and relationship names are capitalized here to make them stand out; use mixed case or lower case with underscores in the actual database. [↑](#footnote-ref-2)