CST8215 - Database

Assignment 1

Preparation

Download all documents attached to this assignment. The assignment 1 PDF contains the same information as this description.

Form groups of 2 or 3 if possible. You must join a group even if you are working individually. Otherwise, you will not be able to submit.

Submission

There will be 4 files submitted as part of this assignment. You must submit all 3 files at the same time. The files are as follows:

- A design document specifying business rules, unknowns and assumptions. This document must be either a word document or a PDF.
- A conceptual ERD in a JPEG or PNG format.
- A physical ERD exported as a PNG or JPEG
- An "export" of from the database design tool in a text format (.txt extension). You may need to rename it from ".sql" to ".txt".

Directions

Select a scenario. Depending on your lecture section a single scenario may be pre-selected for you or the availability of scenarios may be different. Please confirm with your lecture professor. Complete the tasks listed below. Grading schemes for each item is included with the task directives.

Grading overview

This assignment has a maximum score of 66 points graded in 3 parts as follows:

- 14 point - Design document
- 22 points - Conceptual diagram
- 30 points - Physical diagram

Detailed grading is included in each of the tasks.

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Tasks

Design document

Abstract

A design document is sometimes a formal thing and other times informal. This document often serves as a starting point to ensure that you (the developer) understand the unique business needs and data of a client.

Learning objectives

The design document will demonstrate your understanding of business rules and general understanding of basic database design items that affect the end result.

Requirements

You must provide the following:

- An introduction that lists the following items:
  - Group members
  - Chosen scenario
- A list of entities which a short description of what they represent. The description should be clear and concise. It will help the client understand what it is you are referring to.
  Examples:
  - Customer – this entity is used to keep track of the client's customers
  - Infraction – this entity tracks all the various traffic infractions that have been captured by the red light cameras.
- A list of business rules that follow the list of entities. They must be valid, clear and concise. You can include various constraints in here also such minimum quantity is 1.
  Examples:
  - A customer may place zero, one or more orders.
  - An order must have one and only one customer.
- A list of unknowns. All initial database designs have unknows. The list must be clear and concise.
  Examples:
  - Are there other statuses for an order other than new?
  - Can a customer record not include an email address?
- A list of assumptions. All initial database designs involve assumptions. The list must be clear and concise.
  Examples:
  - An order can have multiple statuses, therefore an order status table is required.
  - An order can have different billing and shipping addresses.

Grading

This task has a total of 14 points broken down as follows:

- 2 points for the introduction.
- 4 points – List of entities. Broken down as follows:
  - 3 point - Provided adequate rules that cover all the entities
  - 1 point – descriptions are clear and concise
- 1 point - Rules are clear and concise

- 5 points – Business rules. Broken down as follows:
  - 3 point - Provided adequate rules that cover all the entities
  - 1 point - Rules are clear and concise
  - 1 point - Rules are valid
- 2 point – Unknowns. Broken down as follows:
  - 1 point - Provided unknows
  - 1 point – list was concise and clear
- 2 point – Assumptions. Broken down as follows:
  - 1 point - Provided unknows
  - 1 point – list was concise and clear
- 1 point - Did you submit the document in the correct format?

Conceptual diagram

Abstract

A conceptual diagram allows you to visual the general structure of a database. It can also server as a method of communication between yourself and the client that allows a clearer understanding of how the data interrelate.

Learning objectives

The design document will demonstrate your understanding and application of conceptual diagrams.

Requirements

You must provide a conceptual diagram that includes:

- All the identified entities.
- Each entity should have at least its' candidate key identified
- Relationships as defined by the business rules
- A label that identifies who created the diagram. Include all group member names, scenario and date.

Note: You are not required to resolve many to many relationships in this diagram.

Grading

This task has a total of 22 points broken down as follows:

- 2 points - identification label
- 10 points – Entities. Broken down as follows:
  - 5 points – Covered all the minimum required entities
  - 5 points – Identified the candidate keys
- 10 points – Relationships. Broken down as follows:
  - 5 points - Relationships match business rules. It is possible to have more relationships that what was defined in the business rules. This is the point of the diagram.
  - 5 points - Relationships are properly defined. Do the relationships have the correct cardinality?

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Physical diagram

Abstract

A physical diagram is used as the “blueprint” of the actual database. It contains all of the tables, columns, relations and constraints. Depending on the tools used, often these diagrams can be exported as an SQL file that will actually create the database. You are given a set of arbitrary naming conventions that you must follow. Various employers may use different naming conventions and this is a chance to get used to a set of rules you may not be used to.

Learning objectives

The design document will demonstrate your understanding physical database concepts including:

- Tables
- Columns
- Datatypes
- Resolving many-to-many relationships

Requirements

You must provide a physical diagram that:

- Is properly normalized. This includes breaking down compound and multivalued attributes
- Includes all tables
- Properly defines all relationships between tables
- Has primary and foreign keys properly defined
- All derived attributes removed. If you leave in a derived attribute, you must explain why in a separate document.
- Appropriate datatypes and lengths. Making absolutely everything varchar(255) or Integer is not valid. For example, a postal code would be a varchar(7) for Canada and varchar(10) for the United States.
- At least 1 constraint defined that is neither a primary key or a foreign key. Example would be: quantity > 0
- A label that identifies who created the diagram. Include all group member names, scenario and date.

You will also submit an SQL file exported from the design tool. This will be used to identify whter

Grading

This task has a total of 30 points broken down as follows:

- 2 points - identification label
- 5 points - Did you create all the appropriate tables and columns?
- 5 points - Did you use appropriate data types selected?
- 5 points - Are naming conventions being followed. -1 point for every mistake.
- 5 points - Are the relationships defined properly?
- 1 point - Is there at least 1 constraint defined?
- 5 points - Is the database actually properly designed?
- 2 points - Did you submit the correct files?