CMP7214 – Advanced Databases

Data base model of retail store

Assessment 2

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Abstract

Summary of the entire report

1 Section title

This is the introduction section

1.1 Subsection

2 Domain description

A paragraph in ordinary English explaining the world that the database describes.

2.1 Subsection

3 Database analysis

An explanation of the world in the form of business rules. These basically encapsulate what the main entity types and relationships are, and characteristics of those relationships such as their uniqueness or not and mandatories or not.

3.1 Subsection

The Database Analysis (groupwork - 5%)
You need to provide a reasonably comprehensive description of the domain of the project. List your entities, attributes, relationship constraints as well as business rules and assumptions.

4 Database design

A high-level, ”conceptual” ERD describing your database using Chen notation.

4.1 Subsection

The Database Design (groupwork - 10%)
Create an Entity-Relationship Diagram of your project database using the Chen model diagram. Your database design should include (Minimum requirements):

- at least 8 interrelated entity sets, and at least 40 attributes (total),
- enough relationships to connect each entity set to at least one other entity set.
- be sure to indicate identifying attributes (primary keys)
- put relationship constraints (i.e., connectivity, cardinality and participation).
- one or more M:N relationships,
- one or more recursive relationship
- one or more multivalued attributes.

When you are confident you have a fully qualified diagram, it is desirable that you render your diagram using an E/R design tool, such as (http://www.conceptdraw.com/en/products/cd5/main.php) (this gives you a free trial for 30 days) or http://drive.draw.io/ (There is an E/R style diagram under the ”Software design”templates). Alternatively, you can draw your diagram using a simple Microsoft word diagramming tools and shapes.

It is very important to discuss your ER design with your tutors. During week 10 of the semester each team will submit a document detailing the domain of interest, the database analysis and your ER design description. Students will receive formative feedback about the briefing report within a week.

5 Database normalization

A low-level, ”logical” ERM. A relational schema for your database, with primary and foreign keys specified appropriately. Add comments as necessary to make it clear which are the special tables such as bridging tables and tables introduced to handle multivalued attributes. (This is to help the reader - to save them having to work it out from your conceptual and logical ERDs.). A list of the functional dependencies for your scheme and collection of normalized tables obtained through a normalization process.

5.1 Subsection

The Database Normalization (groupwork - 10%)
Convert your ERD diagram to a relational database schema, i.e. a set of tables, each with appropriate attributes, a primary key, and appropriate foreign keys. A schema diagram for your database, with primary and foreign keys specified appropriately. This is one where every entity type in the diagram corresponds to a table. In this ERM you must have introduced bridging types, must have introduced the special implementation of the symmetric relationship, and must have introduced a handling of the multivalued attributes. Go through the normalization process to come up with a collection of tables that are in third normal forms. Primary and foreign keys should be specified appropriately.

6 Database Implementation

A list of the SQL table creation commands you used plus commands for any extra actions such as adding constraints or changing table characteristics. A list of the SQL Insert commands that aims to insert at least three records in each table. A listing of your test commands/queries and, for the SELECT queries, a listing of their output (or part of the output if the output is very big). Divide your commands/queries into clearly labelled sections corresponding to what it is you're trying to test or retrieve. More credit will be given for meaningful queries which use two or more techniques to make something useful. Think about the kinds of queries that the business might find useful. Your project should explain the query performance and planning. Your project should exploit at least one query optimization technique. Your project might test the concurrency control of your database by running the various queries in separate sessions, you can simulate the real-life operation of your enterprise.

6.1 Subsection

Database Implementation - Table creation (groupwork - 5%)
It is basically quite straightforward and uses the CREATE TABLE command. Use sensible value domains (data types) for the attributes in each table. You can stick to the sort of value domain used in examples in the Additional Notes or textbook, but of course you can branch out and look at the Reference Manual. Include appropriate constraints (e.g. primary key, foreign key, references, unique, not-null, default and check constraints). If you wish, you can add extra sorts of constraint.

Database Implementation - Getting Data into Tables (groupwork - 5%)
Populate your database with sample data to allow testing of the schema. Each table should have a minimum of three rows. You must also exercise at least two of your constraints (e.g. check and default constraints) being sure it correctly catches errors while allowing legitimate data. (Note: you do not need to test not null constraints.) You must turn in printouts of the results of these tests indicating that the SQL statements for your requirements worked correctly and that your constraints correctly allowed good data and caught bad data.

Database Implementation - Test SQL Queries (individual work- 25%)
I'd like you to show the operation of queries that test whether your tables work appropriately. Your queries aim to retrieve vital information that is important for the operation of your database application.
Each student will do the following:

- develop at least three queries about your database, addressing user's needs, and a correct implementation in SQL. Your SQL statements should require a variety of SQL capabilities such as various kinds of join, aggregate functions, order by, distinct, nested queries etc.

- Exploit at least one query or database optimization technique (clustering, partitioning OR indexing)

7 Conclusions

This is the conclusions section.

7.1 Subsection

8 References

This is the references section

8.1 Subsection