

CMPU2007 Databases I (5 ECTS)

CA Phase II 2016-2017

Class group: DT228/2, DT282/2

Lecturer: Deirdre Lawless

Overview

This assignment will take the form of an independent project. It will require you to undertake logical and physical data modelling, implement this model in an Oracle database, populate this with appropriate data, retrieve and update information to support relevant information requests and to alter data students as needed.

Due date/time

Tuesday December 6th 2016 @ 23:59

Marks Achievable

This assignment will be marked out of 100. The result you receive will be weighted to reflect that it counts for 50% of the CA of the module.

Instructions

Please read the details of the assignment carefully and ensure you understand what is required both in terms of content and in terms of submission.

Please use your lab classes to get assistance with this assignment and to complete as much of it as possible.

For the case study provided (see file in Webcourses) you are required to complete the following:

- Create a logical/physical data model using ERWin.
- Build the appropriate SQL to create the tables.
 - You can use Erwin to generate the SQL however you need to make sure you rename all constraints.
- Build the appropriate SQL to populate the tables with data.
- Build the appropriate SQL to retrieve data according to requirements given.
- Build the appropriate SQL to alter the data structures according to requirements given.
- Appropriately comment your SQL.

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ERWIN Requirements

You need to ensure that you have adhered to the following for the ERWin data model you submit:

- **You should include a text box on the canvas the states the following:**
 - **Your Student Number**
 - **Your Name**
 - **Your Programme Code**
 - **Your Lab Group**
- Information engineering notation used;
- Target database set to Oracle;
- All entities are named appropriately for the case study e.g. Customer rather than E/1;
- Entities start with a capital letter, attributes start with a lowercase letter.
- Appropriate datatypes identified for each attribute.
 - The following datatypes are acceptable CHAR, VARCHAR, DATE, NUMBER;
 - Where a datatype requires a width/length this should be provided;
- Primary keys identified for each entity;
- Foreign keys identified where appropriate;
- It should be possible to Forward Engineer this model to generate the SQL to create the physical database which will create a database in Oracle.

Note: Refer to submission requirements for more details of how you should name this file.

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SQL Requirements

You need to ensure that you have adhered to the following for the SQL you submit:

The first four lines of your submission file must state:

- **Your Student Number**
- **Your Name**
- **Your Programme Code**
- **Your Lab Group**

Creating the Database

Table Names and attribute names

All table names and attribute names need to match the ERD created.

Datatypes

Only the following data types are acceptable: CHAR, DATE, NUMBER, VARCHAR2. Scale should be provided for NUMBER and VARCHAR2 datatypes.

Constraints

All constraints (other than not null) must be named and declared at table level.
Primary keys should be named for the table followed by pk e.g. customer_pk;
Foreign keys should be named for the pair of tables involved followed by fk e.g. tbl1_tbl2_fk;
Check constraints should be named for the attribute plus chk e.g. cname_chk;

Data

Generate sufficient data to populate your tables to fulfil the queries required;
Approx. 5 rows per table will be needed.
Data should be persisted.
Note: you need to be careful in the data you choose to insert. You need to ensure that the queries you design will result in data being returned for all the queries/alterations you are asked to do.

Manipulating the Database

Queries

Each query should achieve a particular aim which you must state in the comments.

INNER JOIN

1. Involving two tables – ONE required
2. Involving three tables – ONE required
3. Your joins must use SINGLE ROW functions
A different SINGLE ROW function must be used in each join. The functions should be from different function groups e.g. one CHARACTER and one GENERAL PURPOSE or one NUMERIC and one DATE.

OUTER JOIN

1. LEFT OUTER - ONE required
2. RIGHT OUTER – ONE required (must involve different tables to your left outer join)

AGGREGATE function and GROUPING

1. TWO required (may be part of one of your inner joins)
2. Note: One of your examples should use HAVING

Note: If your queries do not return data, then you will receive only a small portion of the marks available for that query even if the SQL is correct.

Alterations

1. UPDATE or DELETE selected data using a SUBQUERY.
2. ADD a column to a table.
3. MODIFY a column on a table.
4. DROP a column on a table.
5. ADD a value constraint to a table using ALTER.
6. Drop a constraint on a table using ALTER.

Note: If your alterations do not result in changes to the database then you will receive only a small portion of the marks available for that alteration even if the SQL is correct.

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Submission

You will need to submit **a single compressed file (.zip or .rar)** named with your student number e.g. D1111111.rar or D1111111.zip.

Your compressed file should contain:

1. An Erwin file which should be named with your student number <Student #>.erwin e.g. D1111111.erwin.
The model contained in the ERWin file should adhere to the requirements outlined previously.
2. A single SQL file containing all the statements required. This should be named with your student number <Student #>.sql e.g. D1111111.SQL.

This SQL script should correctly create the database adhering to the model provided in your ERWin file and populate it with valid data (differences/errors will result in reduction in marks). The script should include the queries and alterations required. All of the above should be correctly and adequately commented.

Submission Mechanism

Note: Only submit through mechanism listed here – other submissions will be ignored

Submit your single compressed file via the assignment box in Webcourses.

Late submission

- A penalty of 5% will be applied for each day a submission is late.
- No submissions will be accepted after December 13th 2016 @ 23:59.

DO:

1. Familiarise yourself with the requirements of all aspects of the assessment.
2. Ask for clarification on any aspect that is unclear.
3. Familiarise yourself with what plagiarism is and how you will be expected to behave within the DIT, e.g. [DITSU Overview](#), and to take steps to address any issue of concern related to your submission for this assignment.
4. Adhere to the naming conventions as outlined.
5. Submit as directed.

AVOID:

1. Unfair practice:
 - a. This includes using resources, ideas, documentation etc. from the web without acknowledgement.
 - b. Using or taking credit for the work of other students in your submission without permission and acknowledgement.

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Marking Scheme

Erwin Model	30	
Entities Correctly Identified and Named with correct attributes and primary keys selected		15
Relationships between entities are of correct type with correct cardinality on correct attribute		15
Creation SQL	5	
Tables create successfully		2
Constraints declared at table level and create successfully		3
SQL to insert data	5	0
Correctly Formed and working		5
Manipulation SQL (Joins, single row function, group function)	40	
Two inner Joins (2 x 5)		10
Two Outer Joins (2 x 5)		10
Two uses of single row function (2 x 5)		10
Two uses of aggregate function with group (2 x 5)		10
Alteration SQL	20	
Update/Delete using a subquery		5
Add, modify and drop column (3 x 3)		9
Add and drop constraint (2 x 3)		6
	100	100
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Marking Scheme

Negative marking will be applied for the following:		
Files incorrectly named		-1
Student details omitted from either file		-1
No comments included		-1
Target database incorrectly selected in ERWin		-1
Table names in SQL file do not match ERD		-1
Attributes names/datatypes in SQL file do not match ERD		-1
Primary keys are not defined or are incorrect in SQL file		-1
Foreign keys are not defined or are incorrect in SQL file		-1
Primary key/Foreign Key/Check constraints are not declared at table level or are incorrectly/not named in SQL file		-1
Inserts do not populate all tables adhering to the constraints in SQL file		-1
Data is not persisted in SQL file		-1