

CANTERBURY CHRIST CHURCH UNIVERSITY

Computing, Digital Forensics and Cybersecurity

YEAR TWO COMPUTING 2018-19

Developing Database Systems with SQL (MCOMD2DDS) *SEMESTER 1*

ASSIGNMENT 2 (INDIVIDUAL)

03 December 2018

Title: AnyCo Corp

Weighting (as a percentage of whole module): 50%

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Date of Submission:

07 January 2019 before 14:00 via Turnitin and Blackboard (see below)

Any late submissions of the assignment must be submitted via Turnitin and Blackboard (see below)

Assignment Feedback

- feedback, where appropriate, and your mark will be provided on a bespoke feedback sheet;
- discussion of your feedback in more detail will be available by contacting the module leader.

General Instructions

- Please check on the Computing All Years Blackboard within the Assessment Info folder which itself is in the Course Information folder for general advice on how to present your work.
- Late submission of coursework will be penalised.
- You will, from time to time, be contacted by e-mail regarding this assignment. It will be assumed that any e-mail message sent to you (including that sent after you have completed this module) is read, understood and acted upon. It is therefore essential that you check your e-mail regularly.
- You may be asked to attend a formal meeting where any aspect of this assignment may be subject to discussion/demonstration.
- Students are expected to be available at university until the last day of each semester. While the intention is not to prevent students from going home before the end of semester (for example, after their last examination) such action must not interfere with the smooth running of this module. If you plan to absent yourself from university before the end of any semester, please obtain prior written permission from the module leader as early as possible prior to your proposed absence.

Learning Outcomes

By the end of the module students should be able to:

- effectively implement and test a small relational database application system using the tools provided within a modern multi-user database management system environment.

Scenario

Title: AnyCo Corp

AnyCo Corp sells goods through various channels operating worldwide to fill orders for products through various channels. The company has several divisions, namely:

- Human Resources (HR);
- Order Entry;
- Product Media;
- Information Exchange;
- Sales.

each of which has a schema¹, as detailed in Appendix A. This assignment is based on the shaded part of the HR schema.

1. Requirements

- 1.1 Check your understanding of the requirements in conjunction with the material provided in Appendix A. Perceived (and possibly actual) ambiguities will be resolved in timetabled classes.
- 1.2 The `AnyCo_Corp.sql` script file contains the commands required to create *part* of the HR schema (highlighted in Appendix A) and *must* be used to create the various database objects and the data (which should *not* be considered as *test* data) to be used in conjunction with this assignment.
Read this SQL script file *before* you run it, including the various comments, to ensure that you understand what the commands do and what implications they might have regarding any existing database objects that you might have.
Under no circumstances should you change the structure of the database created by the

¹ In an Oracle database a *schema* is a collection of logical structures of data and/or schema objects. A schema is owned by a database user and has the same name as that user. Each user owns a single schema.

AnyCo_Corp.sql script file, for example, by using create or drop Data Definition Language (DDL) commands.

- 1.3 Populate the tables, constructed in 1.2 above, with *additional* data appropriate for testing the requirements detailed in section 1.4 below. *There is no requirement to submit test data as part of your assignment and no marks will be awarded for it.*

DO NOT SUBMIT YOUR TEST DATA AS PART OF THIS ASSIGNMENT.

- 1.4 Create a *single* neat, easy to comprehend and *appropriately* commented command (script) file to meet the user requirements detailed in section 1.4 below using Oracle SQL syntax to provide suitable output for end-users.

The required output may *occasionally* necessitate the appropriate minor use of the formatting capabilities of Oracle SQL*Plus but extensive use of Oracle SQL*Plus is *not* expected.

If you are unable to complete any question please note that marks can still be gained for partial solutions.

The only tools that you are permitted to use to create the required command file are Notepad and/or Notepad++.

Your SQL command file must not include regular² expressions and must be easy to understand/maintain.

You are required to use version 11.0.x.x.x of the Oracle SQL*Plus environment.

If you produce solutions using different versions of the software then you *must* ensure that they work using the software available on the University's network.

- 1.4.1 Display the first and second letter of the first name, last name, hire date and salary minus 22.21% of salary (rounded to the nearest whole number) for all employees whose last name begins with the character 'M' and who were hired after 21 February 1998. The output should be ordered in ascending sequence of hire date.
- 1.4.2 Display the country_id and region_id of every country along with the number of locations that each has. The output should be ordered in descending sequence of country_id.
- 1.4.3 For each department that employs staff with a job id of 'AD_VP' and also employs staff with a job id of 'AD_PRES' list the department name, along with its associated country name and city. The output should be ordered in ascending sequence of department name within city within country name.
- 1.4.4 Display the employee_id and length of employment to date (in days rounded down to one decimal place) of the four most recent employees. The output should be ordered in descending sequence of length of employment.
- 1.5 You should, of course, thoroughly *test* all of your queries. This, after all, is the only way that you can be sure that your code actually works. You may be asked to show details of your testing at a formal meeting where any aspect of this assignment may be subject to discussion. *Whilst testing is essential to prove that your queries actually work you are not required to submit it as part of your assignment and no marks will be awarded for it.* ***DO NOT SUBMIT YOUR TESTING AS PART OF THIS ASSIGNMENT.***

² Oracle's specific use of regular expressions has *not* been covered on this module.

2. Submission Details

Your work must be submitted via Turnitin and Blackboard by the date specified on the front page of this assignment and *must* contain two files, namely:

- a well laid out and *appropriately* commented single Oracle SQL*Plus command file named `S1_2DDS_2018-19_<Your-Full-Name>_queries.sql` that can be used to run *all* the queries, etc. specified in section 1.4 above **submitted via Blackboard**. Your command file must include, at the front, your name as a comment. Your code must be easily understandable and easily maintainable.
You must ensure that your command file can be run by typing,
`start S1_2DDS_2018-19_<Your-Full-Name>_queries.sql` at the SQL> prompt using version 11.0.x.x.x of the Oracle SQL*Plus environment³.
- a report (.docx) which *must* be **submitted via Turnitin**⁴ with the following descriptors:
Assignment Title: `S1_2DDS <Your-Full-Name>`
Document Name: `S1_2DDS_2018-19_<Your-Full-Name>`
- The report *must* contain:
 - a title/front page (including your name);
 - a contents page;
 - an introduction section;
 - a section containing an *exact copy*⁵ (*with no changes whatsoever*) of your Oracle SQL*Plus command file, `S1_2DDS_2018-19_<Your-Full-Name>_queries.sql`, detailed above;
 - a section containing an analysis of the potential/actual weaknesses and limitations of *each* of your queries with regard to the requirements set out in the question;⁶
 - a conclusion section;
 - a references section which *must* include reference to *all* code written by others.

and must conform to the Assignment & Report Layout & Presentation Requirements detailed on the Computing All Years Blackboard within the Assessment Info folder which itself is in the Course Information folder.

³ If you produce solutions using different versions of the software then you *must* ensure that they work using the software available on the University's network.

⁴ TURNITIN will be used for originality/plagiarism checking: you will be allowed to upload your document as many times as you like until the submission date to perform your own plagiarism check in addition to the checking that will be performed by tutors marking your assignment.
For further help and guidance on TURNITIN submissions go to the Blackboard HELP tab. The guidance includes an overview of TURNITIN, a guide to using TURNITIN through Blackboard and information relating to copyright and data protection which you **MUST** read so that you understand your rights.
For further help and guidance on Blackboard submissions go to the Blackboard HELP tab.
Important notes regarding the submission:

- When you submit your work via TURNITIN/Bb you will receive an automatic email receipt.
- You will be allowed to submit your project after the submission deadline. Note, however, that the usual late penalties will apply.

⁵ A screen dump is *not* acceptable.

⁶ If a query has:

- no weaknesses and/or limitations;
- weaknesses and/or limitations;
- syntax errors within it;
- never been run;
- not been *fully* tested;

then you should say so here.

Please do not describe *what* you have done and *how* you did it because this is not a weakness or limitation.

Please do not submit .zip, .rar, .7z, .pdf, etc. files.

Before you hand in your work check that:

- all required items are included;
- items not required are not included.

Now *re-read* all the requirements regarding this assignment to ensure that you are aware of what is required and thus do not:

- present material that does not need to be submitted;
- omit material that is required.

3. Marking Guidelines

Assignment 2 will be marked out of 100.

Section 1.4 Marks will be awarded for: <ul style="list-style-type: none">• neatness of code• appropriately commented code• absence of syntax errors• appropriate columns displayed• appropriate rows displayed in the appropriate sequence• appropriate functionality• appropriate aliases employed• appropriate use of functions• analysis of the weaknesses and limitations	90 marks
Presentation ⁷ See the Assignment & Report Layout & Presentation Requirements detailed on the Computing All Years General Blackboard within the Assessment Info folder which itself is in the Course Information folder.	10 marks

⁷ This refers to the quality of the non-technical aspects of your submission. It does *not* mean that you are required to give a presentation.

APPENDIX A: The AnyCo Corp Schemas⁸

Overview

The database schemas are based on a company, called AnyCo Corp, that sells goods through various channels.

The company operates worldwide to fill orders for products through various channels. The company has several divisions:

- The Human Resources division tracks information about the employees and the facilities.
- The Order Entry division tracks product inventories and sales of company's products through various channels.
- The Product Media division maintains descriptions and detailed information about each product sold by the company.
- The Information Exchange division manages shipping through B2B (Business to Business) applications.
- The Sales division collects business statistics to facilitate business decisions.

Each of these divisions has a schema.

Human Resources (HR Schema) Division

For each employee Human Resource records, an identification number, e-mail address, job identification code, salary and manager. Some employees earn commission in addition to their salary.

The company also tracks information about jobs within the organisation. Each job has an identification code, job title and a minimum and maximum salary range for the job. Some employees have been with the company for a long time and have held different positions within the company.

The company is regionally diverse, so it tracks the locations of its warehouses and departments. Each employee is assigned to a department and each department is identified either by a unique department number or a short name. Each department is associated with one location and each location has a full address that includes the street name, postal code, city, state/province and the country code.

In places where the departments and warehouses are located, the company records details such as the country name, currency symbol, currency name and the region where the country is located geographically.

This assignment is based on the shaded part of the HR schema given at the end of this appendix.

Order Entry (OE Schema) Division

The company sells several products, such as computer hardware and software, music, clothing and tools. The company maintains information about these products, such as product identification numbers, the category into which the product falls, order entry, the weight group (for shipping purposes), the warranty period if applicable, the supplier, the availability status of the product, a list price, a minimum price at which a product will be sold and a URL address for manufacturer information. Inventory information is also recorded for all products, including the warehouse where the product is available and the quantity on hand. Because products are sold worldwide, the company maintains the names of the products and their descriptions in several languages.

The company maintains warehouses in several locations to fulfill customer needs. Each warehouse has a warehouse identification number, name, facility description and location identification number.

Customer information is also tracked. Each customer has an identification number. Customer records include customer name, street name, city or province, country, phone numbers (up to five phone numbers for each customer) and postal code. Some customers place orders through

⁸ In an Oracle database a *schema* is a collection of logical structures of data and/or schema objects. A schema is owned by a database user and has the same name as that user. Each user owns a single schema.

the Internet, so e-mail addresses are also recorded. Because of language differences among customers, the company records the native language and territory of each customer. The company places a credit limit on its customers, to limit the amount of products they can purchase at one time. Some customers have an account manager and this information is also recorded.

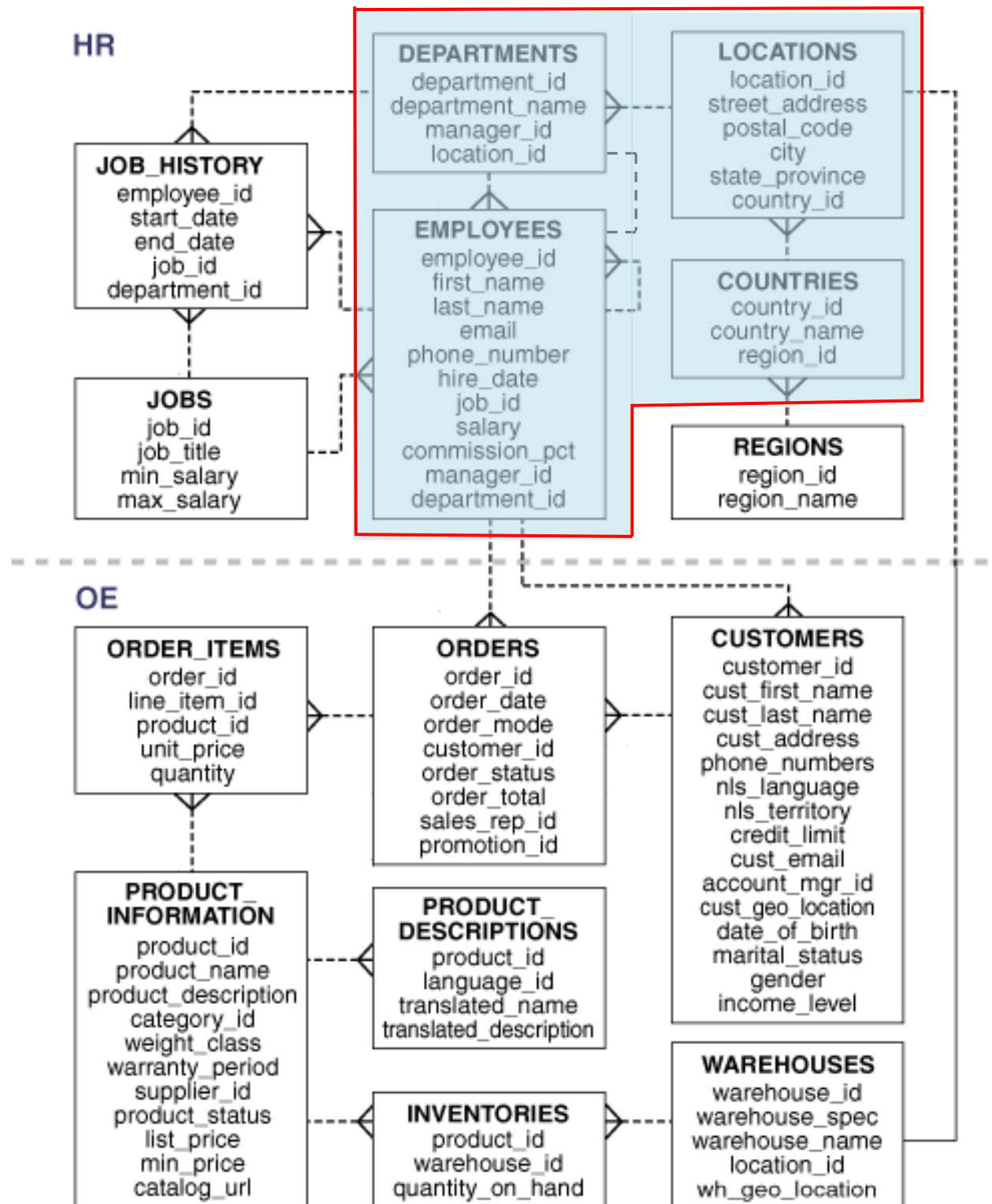
When a customer places an order, the company tracks the date of the order, how the order was placed, the current status of the order, shipping mode, total amount of the order and the sales representative who helped place the order. The sales representative may or may not be the same person as the account manager for a customer. If an order is placed over the Internet, no sales representative is recorded. In addition to order information, the company also tracks the number of items ordered, the unit price and the products ordered.

The OE schema also contains XML purchase order documents. The XML documents are

HR and OE Schema Diagrams

The schema diagrams over leaf illustrate the HR and OE schemas and the relationship between them.

This assignment is based on the shaded part of the HR schema.



This assignment is based on the shaded part of the HR schema.