Database Analysis & Design
INF10002

High Distinction Task S1 2022

Overview

- You have now been given exposure to quite a few tools in the database analysis and design toolkit. In this task, you are going to combine these tools – and your creativity and expertise – to deliver a complete database analysis, design, and piloting activity (i.e. narrative, ERDS, DB solution, queries, reports and visualisations).
- It is important to note that this task is setup for those who feel they've really mastered the content in the unit. It demands you go beyond simple application of concepts and tools. It is not compulsory.
- Only attempt this task if you really feel you can produce a **high quality solution**. A low quality submission that does not adequately meet requirements or has many shortcomings will not be eligible for a HD grade.
- Remember, for D and HD tasks there are no resubmissions! One submission, one grade.

NOTE: A draft copy of your business narrative must be emailed to your tutor by: end of Week 11 (Sunday May 22nd 14:00 AEST).
Final submission – on Canvas (Deadline Sunday May 29th 23:59 AEST check dates on Canvas via Assignment)

Getting Started

- As per our other tasks, you will be submitting a combination of written text, screenshots , diagrams onto your HD template
- Create a file named HDTASK.PDF. This is a PDF of the file named HDTASK.DOCX described below. This file will contain screen shots described in this document.
- When you are ready submit the pdf file onto Canvas via Assignment
- If using Access then Access file must be submitted onto Canvas via Assignment
- If using isql then Drop, Create, Table and Insert Statements should be submitted in Part 3

Business Types

The type of business that you will create a solution for, will be based on your **student ID.** E.g. If your student ID ends in an **'8'**, then your business type must be a **Hotel**.

Last Digit of your Student ID	Business Type
0. or X.	Handling tasks in a Pharmacy
1.	Handling tasks in an Ice Cream Parlour
2.	Handling tasks for a Dog Wash company
3.	Handling tasks for an organisation running Festivals (e.g. Music, Comedy)
4.	Handling tasks in a House Cleaning business
5.	Handling tasks in a Food Catering business
6.	Handling tasks in a Fitness Training business
7.	Handling tasks in a Car Rental company
8.	Handling tasks for a Hotel
9.	Handling tasks for business that provides nannies/babysitters for families

Part 1 – Business Narrative (20 marks)

- Find your business type from the above list.
  Describe how you believe that a relational database solution will assist the business.
- This must be in the form of a business narrative (similar to narratives given to you in ERD tutorials this semester). The narrative must be a **minimum** of 300 words.
    - Describe how the business currently operates.
    - Describe the data that is involved (list possible entities and attributes, use the approach used in case studies in this unit and in Appendix 1 of this document).
    - Describe why it is useful for this organisation to use a database rather than some other application/solution
    - Describe the business rules that apply to the data you want to store (this will provide rules for the ERD)
    - Describe the types of queries, reports and/or visualisations that you believe will provide useful outcomes.

Note: Obviously, you are only trying to implement a database for a narrow part of the business. Choose a small section of the business to concentrate on.

E.g. A real University database solution would provide a solution for student enrolments, unit selection, timetabling, library, conference room bookings, administrative staff, academic staff, cleaning, IT services, classroom equipment, etc. You might concentrate on enrolments and unit selection.

See **Appendix 1** for further discussion about the scope of the narrative.

- Note: Every student attempting the HD task **MUST** send a draft business narrative to their tutor by the deadline shown on the page 1 (or other time by prior arrangement with their tutor). The tutor will then send feedback and suggest any changes required. (Often the student narratives are too complicated and have to be pruned). If necessary, request an appointment (online) with your tutor to get clarification.

  Final submissions made where a draft was NOT supplied in week 11 **will not be graded.**

Part 2 - Entity Relationship Diagram (40 marks)

- Draw an ERD that matches the requirements of the business narrative that you described.
- ERD must be drawn using a Drawing Package. Visio or Draw.io are the Drawing packages recommended. If you want to use another talk to your tutor first.
- Generate a Relational Schema based on the ERD.
- **Do not** include entities or attributes that have not been described in the narrative.
- **Do not introduce Surrogate keys**

Part 3 - Database Solution (10marks)

- Build a database solution in **MS Access** *or* an SQL script that can be run on the Feenix **Oracle** server
- If using Access Tables should be clearly shown in the submitted file
- All tables must have a 9999 suffix (last 4 digits of your student id)
- If using sql then Drop, Create Table and Insert statements is to be submitted here
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Part 4 – Test Data (10 marks)

- Populate the tables with sample data.
- **Your data must include:**
  - **Yourself (use student name & student id)**
  - **Your tutor's name & any id,**
  - **Your convenor's name and any id**
  - **One male world leader. Use their name and any id**
  - **One female world leader. Use their name and any id**
- Each table must have at **least 8 rows of data.**
- There must be sufficient data for queries, reports and/or visualizations to have meaning for your tutor.
- **Create simple queries/sql that list all of the data in each of the tables**.

Part 5 – Queries, Visualisations (20 marks)

- Create a series of **complex** queries(sql scripts) and visualizations that meet some requirements as listed in section 1 above. You must have at least 8 queries and visualizations. There must be a mixture of each. A complex query typically involves using totals and/or multiple tables and/or subqueries and/or outer/inner joins etc.
- Some of the queries(sql scripts) / visualization **must highlight your name, tutors name and lecturer name.**
- Visualizations should show visualization details, be labelled, clear and easily read
- **Note:** You may use Power BI to generate your visualizations, although, this is not essential, especially if you are a Mac OS user (Easy to do from Access. It will require a bit more work if you are using SQL statements. Note: There is no simple method of transferring data from the iSQL tables that you create on the Swinburne Server to Power BI. See **Appendix 2**)

Preparing for Submission

- Copy and Paste the **business narrative** and **business rules** you have deduced to the file named **HDTASK.DOCX**

- Copy and Paste a screenshot your **ERD** into the file named **HDTASK**.**DOCX**
- Copy and Paste your **Relational Schema** into the file named **HDTASK**.**DOCX**
- Copy and Paste your **Relational Diagram (MS Access) or Create Table statements (Oracle)** into the file named **HDTASK**.**DOCX**.
- Copy and Paste the **result set of the simple Queries** which list the data in all tables. Make sure each list is clearly labelled. Place this into the file named **HDTASK**.**DOCX**.
- Copy and Paste the **Query Design Grid** (MS Access) or **SQL statements** (Oracle) into the file named **HDTASK**.**DOCX**. Make sure that all formulae used to generate results are clearly shown.
- Copy and Paste a screenshot of the **result set** of each of the queries into the file named **HDTASK**.**DOCX**
- When completed, save the file as a .pdf document named HDTASK.PDF and upload both **HDTASK**.**pdf** and **Access file** onto Canvas via Assignment

Marking

- Rubric available on Canvas

Appendix 1 – Scope of the Narrative

- A reasonable scope is one that is going to contain a **minimum of 7 entities.**
    - Imagine the organisation is a "local sporting club".
    - The club wants to keep various current and historical data. E.g. a list of current players, list of past players, list of officials, list of players in this week's team, a list of results against other teams.
    - You might want to record that Emma Brown was a female player and played every year from 2009 to 2015.
    - In 2014 and 2015 Emma Brown was club president. She is now non-playing member of the club.
    - You might want to record that the senior team finished in 2nd place in 2016 with 11 wins and 5 losses. The under 16 team finished in 8th place in both 2015 (4 wins/ 12 losses) and 2016 (6 wins / 10 losses).
    - The club may have various membership fees for players. You may want to record all payments made by players and a report of all players who currently owe money to the club. ○ You may want to create a chart that displays the final position of each team over the past 25 years.

- **Your ERD** solution must have **at least two intersection- entities.** (*E.g.* ***Casting*** *in MovieCasting-Actor,* ***Loan*** *in Patron-Loan-LibraryBook,* ***Purchase*** *in Customer-Purchase-Product).* Try not to be over ambitious.
- We know that some students will want to create a database that meets every requirement for a small business or group that they are involved in. This would involve 20 or 30 entities. This would be a mistake. We would suggest that you simply concentrate on a small segment of the organisation and create a solution for that. (Similar to the distinction task)
- **Remember:** You must **email a draft narrative** to **your tutor** to ensure that it is an appropriate problem (see front page for deadline).

Appendix 2 – Preparing data from iSQLJr for PowerBI

If your database solution will be built using SQL statements and you want to use visualizations for a table(s) then you could use one of these options:

This option is simple but a bit fiddly.

- Once your iSQLJr database has been created and populated with data, simply execute queries that list all rows in each table.
- In iSQLJr, copy each result set including the column headings.
- Then Paste this data into a notepad file. Save the notepad file e.g. movie.txt
- In Power BI, use the Get Data / Text file option. The data will be imported as the movie table.
- Repeat this for every SQL iSQLJr table that you have.
- Finally use Power BI's relationship manger to create relationships between the tables.

It took your convenor under 10 minutes to import all 5 movie database tables into Power BI using this method.