**Database Development**

**7CS082**

Dr. Bo Yuan

Database Development (7CS082)

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# Module Leader

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# Key dates and details

|  |  |
| --- | --- |
| **Assessment Type:** | Coursework part 1 |
| **Assessment weighting:** | 60% |
| **Word Count** | 1500 +/- 10% |
| **Learning Outcomes:** | 1 |
| **Submission Method:** | Turnitin for report  Blackboard for code and data |
| **Date Set:** | 9:30am UK time, 22/09/2021 |
| **Submission Date:** | 23:59 UK time, 12/Nov/2021 |
| **Provisional Feedback Release Date:** | 14:00 UK time, 3/Dec/2021 |

# Description of the assessment

Airline Company

We want to design a database for an airline company to underpin a system that will store information on flight schedules, passengers and their bookings, and the staff assigned to the planned flights. There is a particular need to track pilots and their ability to fly certain aircraft types.

The database will allow users to know:

* The passengers of a flight,
* The crew of a flight,
* What plane is assigned to a particular trip,
* The pilot's type rating.  A type rating is a license a pilot is granted to fly a particular type of aircraft.
* What are the flight schedules: e.g. Paris-Caracas (weekly schedule), etc?

**Staff**: Each member of staff in the company is identified by a number (*EMPNUM*), and is described by his or her name (*SURNAME*), given name (*NAME*), address (*ADDRESS*), telephone number (*PHONE*) and his or her monthly salary (*SALARY*). Among the staff, pilots are distinguished to indicate the type ratings they hold and the planes they can fly with these ratings.

**Airplane**: Each airplane owned by the company has a serial number (*NUMSER*). Each airplane is also identified by its manufacturer and model number. Together, these constitute what we call the aircraft: e.g., BOEING 747.

**Passenger**: Passengers are identified by their surname (*SURNAME*), given name (*NAME*), address (*ADDRESS*), telephone number (*PHONE*). A departure is a flight on a certain date (*DATE*). Flights are identified by a number (*FLIGHTNUM*), origin (*ORIGIN*) and a destination (*DEST*) and various intermediate cities (each pair of connected cities defines a stretch). For each city served, we record the time of arrival (*ARR-TIME*) and departure time (*DEP-TIME*) of the flight concerned.

The planes that can be assigned to a flight needs to be recorded. For each flight, a pilot must have been appointed and a particular airplane must have been allocated.

You are required to design, develop and produce two implementations of a database for the airline company. **The assignment will be implemented in two parts:**

* **Part 1:** Database design and optimisation (learning outcome 1)
* **Part 2:** Implementation of queries and interactions with the database (learning outcome 2)

Modelling must be shown in the form of an entity-relationship diagram. For simplicity, it is advised that in a first stage of the design, assume that each flight has no connection. Later, update the design to assume that a flight can have several connections and that passengers and crew may change during travel.

# Assessment Content for Part 1: Database design and optimisation

Individual student must **produce a comprehensive ER diagram of the database and produce two implementations of the design**. To produce the ER diagram, you may use the ER modelling facilities of either MS Access or MySQL Workbench. The implementations must be done in a relational data base management systems (DBMS) of your choice, such as MySQL, PostgreSQL, Oracle Database, Microsoft SQL Server, MS Access etc. You need to implement your design in two different DBMS. Moreover, upon completing the schema design, you will need to populate the databases with some test data (i.e., random fake data) to validate the design. The implementations should include sufficient test data to demonstrate necessary functionalities.

**Follow these STEPS carefully. You are required to:**

1. Produce a database design report to detail the implementation process including the Entity Relationship Model; normalisation process; detailing of data types, candidate keys, primary keys, constraints (foreign key and CHECK), etc.; Coding of tables and primary and foreign key creation; Query statements; Values insertion; Update and Delete data, etc.
2. The report should provide a justification and a critical evaluation of the two different implementations provided. Normalisation, optimisation and performance of the database design should also be discussed in the report.
3. A copy of source code and database files for the two implementations should be uploaded with the report.
4. The word requirement for Part 1 report is **1500 words (**+/- 10%)**.** Failing to meet this requirement, your work will be marked down up to 5 penalty marks.

# Assessment Rubric

Assessment Criteria for assignment 1: **Database design and optimisation** (60%):

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Criteria** | **5-39%**  **Fail** | **40 – 49%**  **Narrow fail** | **50 – 59%**  **Pass** | **60 – 69%**  **Good** | **70-79%**  **Very good** | **80-89%**  **Excellent** | **90-100%**  **Outstanding** |
| Choice of material. Academic research. Introduction and outline of the key issues identified.  (Introduction of the system and the justification of selection of the database)  **(20%)** | Superficial. Little insight shown in selection of material. Covers few/none of key subject issues. | Inadequate evidence of some insight into the subject area. | Basic material is appropriate. The student has covered key subject areas but contains some errors. | Report demonstrates a good understanding of the subject area covering all key issues. Contains a few errors. | Very good academic learning ability achieved. Very good quality of output showing creative and innovative flair. | Excellent standard ability achieved.  Referencing is consistently used, complete and accurate. | Meets all criteria in 80-89% range, plus demonstrates exceptional ability and insight, indicating the highest level of technical competence. |
| Logical organisation of thoughts and arguments; brevity, clarity, and understanding.  (Normalisation, E-R diagram and Query statements)  **(60%)** | Little originality. Has failed to get to grips with the subject. Inadequate discussion Does not show full understanding of what is required. | Arguments are unclear and underdeveloped.  Failing to demonstrate an adequate understanding.  Statements contain many errors. | The student has demonstrated a basic understanding of the problem area. A theme is present, but underdeveloped and contains some errors. | A clear and useful theme is developed. Insight into implications. Good and concise arguments. Contains a few errors. | Very good understanding and exposition of relevant issues that shows insight and draws together the chosen subject key features into a theme, no errors. | Excellent standard ability achieved.  Relevant technical skills are demonstrated at an excellent level.  Referencing is consistently used, complete and accurate. |
| Summary and Conclusions  **(10%)** | Little or no rationale. Limited if any conclusions / recommendations missing or inappropriate reached | Failing to draw out basic lessons learned. None or inadequate recommendations given. | Analysis draws out lessons learned and tries to develop a theme. Some supported recommendations are given. | Analysis draws out appropriate conclusions with supporting recommendations. | Very good and well-formed recommendations made. Clearly structured and logically developed arguments. | Excellent future work and improvement have been discussed. |
| Report writing:  **(10%)** | Riddled with errors, incoherent and disjointed.  Many references are inconsistent between the text and the list; a number of mistakes in the reference list. | Frequent errors. Somewhat incoherent and disjointed.  Some references are inconsistent between the text and the list; reference list with many mistakes. | Occasional errors.  Generally coherent. Lack of clarity in places.  Referencing and citation style is consistent between the text and the list; reference list with some mistakes. | Few errors. Coherent and clearly expressed.  Referencing and citation style is consistent between the text and the list; reference list with only a few minor mistakes. | Free of errors. Very good coherence and clarity of expression.  Referencing and citation style is correct and consistent between the list and the text; reference list completely concise without errors. | Excellent standard ability achieved.  Referencing is consistently used, complete and accurate. |
| % Mark 1-4% | | | | **Nothing of Merit:** Nothing of value is contained in the submitted work. The work presents information that is irrelevant and unconnected to the task; no evident awareness of appropriate principles, theories, evidence or techniques | | | |
| NS | | | | **Non-submission:** No work has been submitted | | | |
| Z | | | | Academic offence notation Applies to proven instances of academic offence | | | |

# Submission

You will have **two submission points for report and source code, respectively**:

1. **Turnitin submission point for reports**

**Formatting Requirements:** Please submit each report as a single Word document in the Blackboard Assignment Submission link for the module. The file name must use the following format:

For part 1: nnnnnnnnn-7CS082-report-part1.docx

where nnnnnnnn is you student number

1. **Blackboard submission point for the source code, database files and relevant supporting files.**

If you have used a specific database development tool, or third-party packages outside of those mentioned above, it has to be provided as well.

**Formatting Requirements:** All data and source code should be included in a single zip file andsubmit in the Blackboard Assignment Submission link for data. The file name must use the following format:

For part1: nnnnnnnnn-7CS082-data-part1.zip

where nnnnnnnn is you student number

**Please note that all assignments will be checked for plagiarism using computer software.**

Failure to submit all these items by the specified deadline and without an authorized extension will result to a FAIL grade. For detailed information about Late Submissions terms see the “Assessment” page in the Blackboard system.

# Anonymous Marking

You must submit your work using your **student number** to identify yourself, not your name. You must not use your name in the text of the work at any point. When you submit your work in Turnitin you must submit your student number within the assignment document and in the *Submission title* field in Turnitin. The principle behind the usage of anonymous marking of assignments is to reassure students that all assignments are marked in an equitable and unbiased manner, thereby ensuring the maintenance of high academic quality standards within the marking of the assessments

# Assessment Regulations

The [University’s regulations, policies and procedures](https://www.derby.ac.uk/about/academic-regulations/) for students define the framework within which teaching and assessment are conducted. Please make sure you are familiar with these regulations, policies and procedures.

**End of Assignment Specification**