CM12004 – Discrete Mathematics and Databases

Coursework: SQL Databases with Python

Set: 20/11/2023 (week 8) **Due: 15/12/2023 (week 11), 8pm**
Percentage of overall unit mark: 15%
Submission Location: Moodle **Submission Components: a PDF or a word file containing ER diagram and replit link to the program.** **Submission Format: .doc, .docx, .pdf file named 'Your Bath username'**
Anonymous Marking: No

1.1 Objective

- To understand database design using the E-R model.
- To consolidate the introduction to Python and SQLite
- To provide experience in creating a small database application with Python

1.2 Learning Outcomes

The learning objective of this lab is to practically demonstrate how programs and users can interact with databases through query languages.

1.3 Scenario

Suppose you have been appointed as a Database Manager of an Airlines. The company wants to update the overall IT system. In this regard, they want you to design a Flight database that holds data regarding different flights, pilots operating those flights and destinations of those flights. The company would like you to create a program that allows their staff members to add and manipulate the database according to changed flight schedules. The program should present a menu with a list of options in order for the user to interact with the database.

1.4 The requirements of the task

The task should be conducted in two steps.

1. You need to create a logical design of the database using the E-R model considering the following assumptions.

a) An aircraft is assigned to several flights while a flight is assigned to only one aircraft.

b) A pilot can conduct several flights and a flight can be operated by several pilots.

c) Each flight, aircraft and pilot must possess a unique identifier.

2. You need to implement the above design in the relational model. In this regard, create a program that allows adding, updating, searching, deleting, and viewing flight information in the database. While creating the program, you should consider the integrity and cardinality constraints as reflected in the E-R model.

1.5 Deliverables

This lab constitutes **15% of your total unit.**

You need to submit a pdf or a doc file for task 1.

For task 2, you need to create a python file (*.py) which compiles and runs the code. In this regard, you should submit the repl.it link to your code in the pdf/doc or post repl.it link directly in the submission area on Moodle. Make sure the repl link is not edited after the submission date or it will be considered a late submission.

1.6 Criteria for Marking/Marking Scheme

Scheme	**Marks**
Design an E-R diagram considering all the assumptions	15
Create a database that contains relevant tables	5
Insert data	10
Search specific data	10
Update data (update attribute values)	10
To delete data and show remaining data after deletion	10
Calculate and present summary statistics (e.g., how many flights per specific week or to a specific destination per month)	10
Add any extra functions of your choice	20
Code formatting, comments, user-friendliness and presentation of the output	10

1.7 Feedback

The **formative feedback** will be given by tutors during the lab session.

You will receive **summative feedback** on your work within three semester weeks of the submission deadline. The feedback will discuss your performance based on the criteria for marking presented in the

marking scheme above, including what you did well and how specific components/sections could have been improved.

1.8 Academic Integrity

Your work will be checked to ensure that you have not plagiarised. The code will also be checked for any collusion. Collusion is a form of plagiarism where two or more people work together to produce a piece of work all or part of which is then submitted by each of them as their own individual work. The University of Bath and the Department of Computer Science takes this offence very seriously. For more information about the plagiarism policy at the University see: https://library.bath.ac.uk/referencing/plagiarism

1.9 Extension requests:

Requests for extensions should be made to the Director of Studies. Lecturers and tutors cannot approve extensions. Please make sure you are familiar with the department's coursework deadline extension policy which can be found on Moodle Computer Science Undergraduate Zone.

It is your responsibility to check that correctly submit your work. Once you have submitted to Moodle you should download your submission and **check it**.