School of Computing

Database Systems Development Coursework 2022/2023

Module Code	M30232
Module Title	Database Systems Development
Module Coordinator	Mark Venn mark.venn@port.ac.uk
Assessment Item Number	Item 1
Assessment Title	Coursework - Solent Boats Database
Date Issued	2022-10-18

Schedule and Deliverables

Deliverable	Value	Format	Deadline / Date	Late / ECF Deadline
ERD	**33.34%**	A single PDF with ERD and assumptions	**2300 1st Feb 2023**	**2300 15th Feb 2023**
Code / Queries	**66.66%**	Two text files: One containing the SQL that created and populated your database & one that contains the queries and output.	**2300 1st Feb 2023**	**2300 15th Feb 2023**

NOTES AND ADVICE

- The Extenuating Circumstances procedure is there to support you if you have had any circumstances (problems) that have been serious or significant enough to prevent you from attending, completing or submitting an assessment on time. If you complete an Extenuating Circumstances Form (ECF) for this assessment, it is important that you use the correct module code, item number and deadline (not the late deadline) given above.
- ASDAC are available to any students who disclose a disability or require additional support for their academic studies with a good set of resources on the ASDAC Moodle site
- The University takes any form of academic misconduct (such as plagiarism or cheating) seriously, so please make sure your work is your own. Please ensure you adhere to our Code of Student Behaviour and watch the video on plagiarism.
- Any material included in your coursework should be fully cited and referenced in APA 7 format. Detailed advice on referencing is available from the library, also see TECFAC 08 Plagiarism.
- Any material submitted that does not meet format or submission guidelines, or falls outside of the submission deadline could be subject to a cap on your overall result or disqualification entirely.

- If you need additional assistance, you can ask your personal tutor, student engagement officer ana.baker@port.ac.uk, academic tutor xia.han@port.ac.uk or your lecturers.
- If you are concerned about your mental well-being, please contact our Wellbeing Service

This module is being assessed by coursework and a final exam. The weighting of each of these items is 50%.

Coursework M30232

Coursework Brief

Throughout this spec, the term *boat* can be taken to mean any type of craft that can be used on water. This includes what might be seen as traditional water craft such as a clinker built dinghy or a jet ski. See the examples section for ideas.

You have been asked to create a database for a boat repair and servicing company, Solent Boats. They currently store all of their data in a series of spreadsheets. The contents of these are linked to provide an overview of the company. They have recently lost two of these spreadsheets following a hard drive failure and now their entire system no longer works. You need to design and build a database, using PostgreSQL, to fulfil the client's requirements. These are shown in the requirements section below.

Background

Solent Boats, (SB), is a small but successful marine servicing company that is growing year on year. They currently have 4 boatyards with between 3 and 7 members of staff at each one. (There are plans for further yards if there is enough demand in other areas). There is one member of staff at each site that acts as a manager. The role of manager may be the only role they have or they may have more than that one role. This is due to the number of staff working in each yard. The larger yards have enough work for the role of manager to be the only role held but in smaller yards they role is held alongside another role. For example, engine technician and manager. **Your data should allow this situation.**

The roles that you need to create are listed below:

ROLE
MANAGER
GLASS FIBRE SPECIALIST
ENGINE TECHNICIAN
GENERAL
ELECTRICIAN
TECHNICIAN

As stated elsewhere, there are some boatyards that have less staff and some that have more. It could be that one yard has a person who has two or more of these roles. **Remember that every yard has a manager. This is not always the only role they have.**

Currently they store details of customers and their boats, along with service details, both historic and services booked in the future. They stored who worked on a service, this may be one or more staff members. **SB do not need you to store details on parts in stock or parts that are used in a service.** They have a separate system that just needs to store the service ID number against the parts used. SB have decided that they are going to start again with data collection and storage so you do not need to think about the data structure that exists in the CSV. They have given the minimum requirements that are needed for their business to run properly.

Requirements

SB need a database that will store, *as a minimum*, the following data.

- Staff (Personal and work details such as work email addresses and roles)
- Customers (Personal details such as home address and contact details)
- Boat details (Such as name and when built. We do not need information such as size but we do need fuel type.)
- Servicing completed and pre-booked
- Staff involved in each service

There will be more data than this that needs to be stored and it is up to each student to decide what is needed. **These items are the minimum required by the client, (and to fulfil the criteria of the coursework).** Higher marks will be given to students who add more in-depth data and information to their databases and queries.

Providing only the basic requirements will result in lower marks.

Submission

You must submit the following **by** the deadline shown on the front page:

1. ERD - In a PDF
    - A list of design assumptions should be included with the ERD.
    - The ERD **must** be electronically generated. Hand drawn or photos will receive 0, (**ZERO**) marks.
2. Code - In a SQL (text) file
    - This needs to be the code to create and to populate your database.
    - The code **must** be manually created. Code that appears to have been generated by a tool such as pgAdmin will receive 0, (**ZERO**) marks.
3. 5 Queries - In a SQL (text) file
    - The code that runs on your own database for each of the 5 queries.
    - Output from the queries along with the rationale **for each** query - In a SQL (text) file.

- The database **must** be named upXXXXXXX_cw where **upXXXXXXX is to be replaced by your student id.**

You will need to submit 3, (THREE), files. One PDF that contains the ERD and your assumptions, one text file that contains both the code that created your database and the code that populated the database with dummy data and one text file that has the query code and output. **Moodle is set-up to accept only files with .sql, .pdf and .txt file extensions when submitting.**

Important

You MUST follow these instructions.

> **THIS COURSEWORK IS TO BE DONE AS AN INDIVIDUAL AND NOT IN GROUPS.**
> **CODE MUST BE THE CODE USED TO CREATE AND POPULATE THE DATABASE AND NOT THE OUTPUT OF A BACKUP DUMP.**
> **CODE MUST BE CREATED MANUALLY AND NOT USING TOOLS THAT WRITE THE CODE FOR YOU.**
> **WE EXPECT AT LEAST 20 CUSTOMERS AND AT LEAST 30 SERVICE RECORDS SPREAD ACROSS THE DIFFERENT BOATYARDS.**

Suggestions

Remember that a customer may own more than one boat.

You can use any tool that you find useful to create your ERD such as Lucid Chart or Visio. (**Visio is available with your Microsoft Office package that you have for free as a student.**)

Use dummy data generators such as generatedata.com or mockaroo to populate your tables.

Assumptions are short sentences that explain your design choices. In the real world you could ask your client what they need to store and how the data should look when retrieved. In this case you can not do this so you have to make assumptions as to how it works. Using assumptions gives the person marking the work an idea why you chose to design something the way you did.

Writing a query that inserts data into the table, such as a new staff member's details, is NOT a suitable query. This is the normal day to day query that will not give you high marks.

THE NUMBER OF BOAT YARDS AND STAFF ACROSS EACH BOATYARD IS UP TO THE STUDENT TO DECIDE.

Do not leave submission until 10 minutes before the deadline!

Marking Scheme

The marks are allocated as below.

ERD 25 *marks*

Assumptions & Normalisation 10 *marks*

CODE 30 *marks*

QUERIES (5 x 5)
Rationale 1 mark *(per query)*
Query 3 marks *(per query)*
Output Quality 1 mark *(per query)*

Innovation *10 marks* These marks are giving for going beyond the minimum and providing more more intelligent / useful queries. They are given at the discretion of the marker.

Element	Description	Max Marks
ERD	Meaningful entities with suitable attributes. Attributes & entities should have meaningful names Relevant and correct data type/size Correct cardinalities, PKs and FKs Logical and clear layout (no overlapping lines) Crow's Foot notation (**0 Marks for any other notation**)	25

Element	Description	Max Marks
Assumptions	Good set of justifications and assumptions. Repeating case study information is not an assumption. "*Remember that every yard has a manager. This is not always the only role they have.*" is given, **not** an assumption	10
& Normalisation	Tables are in 3NF Data is de-normalised where appropriate	

Element	Description	Max Marks
Code	Code matches the ERD and your assumptions Code has been written by the student and not by a code generator Code is well laid out with comments when needed Code should be in the correct order. This means that the code should be able to run by copying and pasting straight into PostgreSQL. Remember that tables need to be created in the right order.	30

Element	Description	Max Marks
Queries	The queries should be complex enough for a business (not just a SELECT * FROM). Joins will be used to get the best marks The queries should have the column name output formatted for the end user (e.g. use AS). The queries *MUST* be included at the end of the SQL file you have created for the database and evidence in the main report with screenshots. **Rationale** 1 mark *(per query)* **Query** 3 marks *(per query)* **Output Quality** 1 mark *(per query)*	25 (5 x 5)

Element	Description	Max Marks
Innovation	Awarded for extraordinary work that goes beyond minimum scenario description and requirements, including but not limited to organised layout, grammar, references and anything else that is outstanding.	10

Example Watercraft

- Sea doo Jetski
  - Fuel - *Petrol*
  - Engine Size - *899cc*
  - Dimensions (L x W x H) - *331cm x 125cm x 114cm*
  - Capacity - *1-3 persons*
- Princess V50
  - Fuel - *Diesel*
  - Engine Size - *2 x 5500cc*
  - Dimensions (L x W) - *1549cm x 411cm*
  - Capacity - 4 (*1 double berth + 1 twin berth*)
- Sailing Dinghy
  - Fuel - *N/A*
  - Engine Size - *N/A*
  - Dimensions (L x W) - *250cm x 150cm*
  - Capacity - (*1 person*)