FIT3171 Databases

Creating, Populating and Manipulating Database - Run Monash (RM)

Version 1-1 changes highlighted: See pages 9, 10, 11, 14 and 15

Purpose	Students will be asked to implement, via SQL, a small database in the Oracle RDBMS from a provided logical model case study, followed by the insert of appropriate data into the created tables. Once populated, the database will perform specified DML commands and make specified changes to the database structure via SQL and code PL/SQL to enforce business rules. Students will then use SQL and NoSQL to write queries to produce the specified output. This task covers learning outcomes: 1. Apply the theories of the relational database model. 3. Implement a relational database based on a sound database design. 4. Manage data that meets user requirements, including queries and transactions. 5. Contrast the differences between non-relational database models and the relational database model. 6. Develop programming structures within a database backend.
Your task	This is an open-book, **individual task**. The output for this task will be a set of tables and data implemented in the Oracle RDBMS. In addition, students will create a set of relational (Oracle) and non-relational (MongoDB) queries that meet the user requirements and code PL/SQL to enforce business rules.
Value	**40%** of your total marks for the unit
Due Date	**Mon, 9th June 2025 at 4:30 pm**
Submission	• Via Moodle Assignment Submission • FIT GitLab check-ins will be used to assess the history of development
Assessment Criteria	• Application of relational database principles. • Handling of transactions and the setting of appropriate transaction boundaries. • Application of SQL statements and constructs to create and alter tables, including the required constraints and column comments, populate tables, modify existing data in tables, and modify the "live" database structure to meet the expressed requirements (including appropriate use of constraints). • Application of relational algebra operations to produce outputs that meet user requirements • Application of SQL select statements to produce outputs that meet user requirements. • Mapping of relational database data into a non-relational database data structure. • Application of MongoDB operations to produce outputs that meet user requirements.

	● Development of Functions, Procedures and Triggers (PL/SQL) to enforce business rules and data integrity
Late Penalties	● 5% of the marks available for the task (-5 marks) deduction per calendar day or part thereof for up to one week ● Submissions over 7 calendar days after the due date will receive a mark of zero (0), and no assessment feedback will be provided.
Support Resources	See Moodle Assessment page
Feedback	Feedback will be provided on student work via: ● general cohort performance ● specific student feedback ten working days post-submission ● a sample solution

SCENARIO

Run Monash (RM) is a running carnival which is held on separate dates at various Monash campuses during different seasons (Summer, Autumn, Winter and Spring) of the year. The carnival naming convention that Run Monash uses is RM <season name> Series <campus name> <year>. So, for example, a carnival to be held during the Autumn season at the Clayton campus in 2024 will be named RM Autumn Series Clayton 2024.

Anyone can attend an RM Carnival; the carnivals are open to the public as well as Monash staff and students. A carnival is run on a particular date, in a particular location, and only lasts for one day. RM only runs one carnival on any particular date. During a carnival, a range of event types are offered from the following list (only some may be offered):

- Marathon 42.2 Km
- Half Marathon 21.1 Km
- 10 Km Run
- 5 Km Run
- 3 Km Community Run/Walk

Run Monash expects to offer around 15 - 30 such events across all carnivals in a given year.

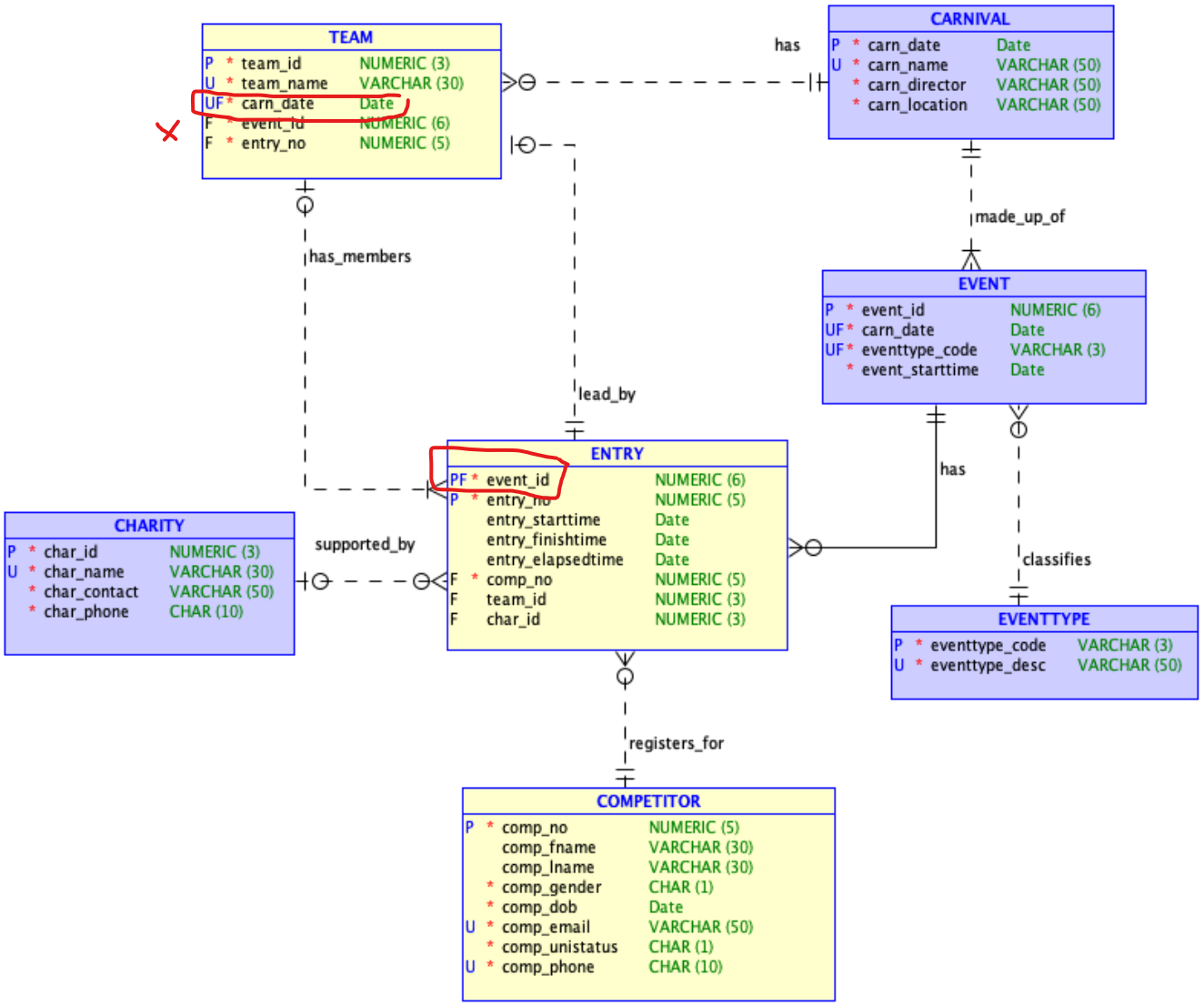
When a competitor first registers for Run Monash, they are assigned a unique competitor number. They are required to supply a unique phone number and a unique email address for contact purposes (no other competitor can be assigned the same email or phone number).

When a carnival is being offered, Run Monash contacts all registered competitors and provides details of the carnival date and what events are on offer. Competitors can only enter one event at a particular carnival. Every entry in an event is assigned an entry number. The entry numbers are reused in each event. As a result, each event starts numbering entries from one. Run Monash also, on the carnival day, using official timing devices, record the entrants' starting and finishing times. Immediately after the event has been completed, all entrants who have completed the event (i.e. have a finishing time) are assigned a calculated elapsed time.

Teams are identified by a unique team name that the team manager must select when they first create the team. The team manager can then add/invite other competitors from the carnival to join their team. Team members can be any entered competitor in any event in the carnival. Team names are unique only within a given carnival. A given team name may be reused by different competitors in a different carnival, since teams are recreated for each carnival.

Individual competitors in a carnival (entrants) may nominate a charity for which they will raise funds, although not all entrants in the carnival will do so. All charities for which funds can be raised must first be approved by Run Monash.

A model to represent this system has been developed:



You must ensure that any activities you carry out in the database to complete the assignment tasks conform to the requirements of the model displayed above.

The schema/insert file for creating this model (rm-schema-insert.sql) is available in the archive ass2_student.zip. This file partially creates the Run Monash tables and populates several of them (those shown in purple on the supplied model above). Please read this schema carefully and be sure you understand the various data requirements.

IMPORTANT points for you to observe when completing this assignment are:

1. The ass2-student.zip archive also contains seven script files to code your answers in. **You MUST ensure these files are regularly pushed to the GitLab server so that a clear development history is available for the marker to verify your work (a minimum of fourteen pushes are required - 2 pushes per file).** In each file, you ***must*** fill in the header details with your name and student ID before beginning work. Your SQL script files **must not include any SPOOL or ECHO commands**. Although you might include such commands when testing your work, **they must be removed before submission** (a -10 mark grade penalty will be applied if your documents contain spool or echo commands).
2. You are free to make assumptions if needed. However, ***your assumptions must align with the details here and in the Ed Assignment 2 forum*** and must be clearly documented (see the required submission files).
3. When handling dates with SQL, the default date format must not be assumed; you must use ***the TO_DATE and TO_CHAR functions where appropriate***.
4. **ANSI joins must be used** where the joining of tables is required.
5. In completing the following tasks, you must ***design your test data so that you always get output for the queries specified below*** - this may require you to add further data as you move through completing the required tasks. Such extra data MUST be added as part of Task 2 (i.e. as part of your test data load). ***Queries that are correct but do not produce any output ("no rows selected" message) using your test data will lose 50% of the marks allocated***. So, you should carefully check your test data and ensure it thoroughly validates your SQL queries.

Steps for working on Assignment 2

1. Download the Assignment 2 Required Files zip archive (ass2-student.zip) from Moodle.
2. Extract the zip archive and place the contained files in your local repository in the folder:
   /Assignments/Ass2
   Do not add the zip archive to your local repo.
3. Examine the extracted files, i.e. read carefully through them and ensure you understand their content.
4. In each supplied script, fill in the header details with your name and student ID. Then, add, commit and push them to the FITGitLab server.
5. Run rm-schema-insert.sql from the supplied zip archive to set up the initial state of the database.
6. Write your answer for each task in its respective file (e.g. write your answer for task 1 in T1-rm-schema.sql and so on).
7. Save, add, commit and push the file/s **regularly** while working on the assignment.
8. Finally, when you have completed all tasks, separately run each SQL or MongoDB ***as a script (not as individual statements) and ensure there are no errors except for errors generated by drop or raise_application_error commands***. Upload all required files from your local repository to Moodle. Check that the files you have uploaded are the correct files (download them from Moodle into a temporary folder and check that they are correct). After you are sure they are correct, submit your assignment.

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For all assignment tasks, **your final script must run as a script without errors, except for SQL errors generated by the DROP and/or RAISE_APPLICATION_ERROR statements**. **Any task's script that runs with an error will receive a maximum grade of half of the task's available marks -1**. For example, if your task 1 script runs with an error, regardless of the code contained, your maximum grade will be 15/2 => 7.5 - 1 = 6.5 marks. This will be applied even if the error is simply a forgotten semicolon. Thus, **please carefully check that your final scripts for all tasks run without error**.

In arriving at your solutions for Assignment 2 you are ONLY permitted to use the SQL/NoSQL structures and syntax that have been covered within this unit:

- **Topic 5 Workshop and Applied 6 - Creating & Populating the Database**
- **Topic 6 Workshop and Applied 7 - Insert, Update, Delete (DML) and Transaction Management**
- **Topic 7 Workshop and Applied 8 - SQL Part I - Basic and Intermediate**
- **Topic 8 Workshop and Applied 9 - SQL Part II- Advanced**
- **Topic 9 Workshop and Applied 10 - PL/SQL I**
- **Topic 10 Workshop and Applied 11 - PL/SQL II**
- **Topic 11 Workshop and Applied 12 - Non-Relational Database**

SQL/NoSQL syntax and commands outside of the covered work will NOT be accepted/marked.
You must NOT use PL/SQL commands such as BEGIN/END except in Task 5 nor SQL structures such as WITH since these were not covered in the unit. Views must not be used in completing these tasks.

You must also keep up to date with the Ed Assignment 2 forum where further clarifications may be posted. Please **ensure you do not publicly post anything that includes your reasoning, logic, or any part of your work to this forum**; doing *so violates Monash plagiarism/collusion rules* and has significant academic penalties. Attend a consultation session or use a private Ed post to raise such questions.

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GIT STORAGE

Your work for these tasks MUST be saved in your local working directory (repo) in the Assignment/Ass2 folder and **regularly pushed to the FIT GitLab server to build a clear history of the development of your approach**. ***Any work outside this folder will not be marked***. A minimum of fourteen pushes to the FIT GitLab server is required (2 pushes per solution script). Please note that fourteen pushes are a minimum; we expect significantly more in practice. All commits must include a **meaningful commit message** that clearly describes what the particular commit is about and **must be correctly assigned to your valid GitLab author**.

You must regularly check that your pushes have been successful by logging in to the FIT GitLab server's web interface; you must not simply assume they are working. Before submission via Moodle, you must log in to the GitLab server's web interface and ensure your submission files are present and their names are unchanged.

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TASK 1: DDL (15 marks)

For this task, you are required to add to **T1-rm-schema.sql**, the CREATE TABLE and CONSTRAINT definitions that are missing from the supplied partial schema script in the positions indicated by the comments in the script. You must use the default delete rule (i.e. no action/restrict) for all foreign keys.

The table below provides details of the meaning of the attributes in the three missing tables. You **MUST use exactly the same relation and attribute names and data types/sizes as shown in the data model** above to name the tables and attributes that you add. The attributes **must be in the same order as shown in the model**. These new DDL commands *must be hand-coded, not generated in any manner (generated code will not be marked)*.

Table name	Attribute name	Meaning
COMPETITOR		
	comp_no	Unique identifier for a competitor
	comp_fname	Competitor's first name
	comp_lname	Competitor's last name
	comp_gender	Competitor's gender ('M' for male, 'F' for female, or 'U' for 'Undisclosed')
	comp_dob	Competitor's date of birth
	comp_email	Competitor's email - unique for each competitor
	comp_unistatus	Competitor is a university student or staff ('Y' for Yes or 'N' for No)
	comp_phone	Competitor's phone number - unique for each competitor
ENTRY		
	entry_no	Entry number (unique only within an event)
	entry_starttime	The entrant's start time (time only), stored using the format of hh24:mi:ss
	entry_finishtime	The entrant's finish time (time only), stored using the format of hh24:mi:ss
	entry_elapsedtime	The time the entrant took to complete the event, stored using the format of hh24:mi:ss (e.g. 01:25:30 for 1 hour 25 minutes and 30 seconds)
TEAM		
	team_id	Team identifier (unique)
	team_name	Team name

To test your code, you must first run the provided script rm-schema-insert.sql to create the purple supplied tables.

TASK 2: Populate Sample Data (20 marks)

Before proceeding with Task 2, you must ensure you have run the file rm-schema-insert.sql (which **must not be edited in any way**, followed by the extra definitions that you added in Task 1 above (T1-rm-schema.sql).

Load the COMPETITOR, ENTRY, and TEAM tables with **your own test data** using the **T2-rm-insert.sql**. Add (write) SQL commands to **T2-rm-insert.sql** that will insert *as a minimum (i.e. you may and should insert more)* the following sample data:

(i) 15 COMPETITOR entries
- Have at least 5 competitors who are Monash student/staff
- Have at least 5 competitors who are not Monash student/staff

(ii) 30 ENTRY entries
- Included at least 10 competitors
- Included at least 6 events from 3 different carnivals
- Have at least 5 competitors who join more than 2 events
- Have at least 2 uncompleted entries (registration only)

(iii) 5 TEAM entries
- Have at least 2 teams with more than 2 members
- At least one team name is used in two different carnivals (eg, the team name 'Coyotes' is used in two different carnivals).

In adding this data, you must ensure that the test data thoroughly tests the model as supplied to ensure your schema is correct (you are not required to submit or code fail tests; all insert statements must execute correctly).

Your inserted data must conform to the following rules:

(i) Treat all the data you add as a single transaction since you are setting up the initial test state for the database.

(ii) The primary key values for this data should be hardcoded values (i.e. NOT make use of sequences). If the primary key attribute's data type is numeric, it must consist of values below 100.

(iii) The data added must be sensible, e.g. entry finish times should be after entry start times with a sensible elapsed time.

For this task **ONLY,** Task 2, you may manually look up/calculate and include values for the loaded tables/data directly where required. However, you can still use SQL to get any non-key values if you wish. You may make use of AI & Generative AI tools to assist you with the generation of this data; however, if you do so, you must clearly acknowledge the source following Monash Guidelines. Place the acknowledgement in the "Comments for your marker" section at the top of T2-rm-insert.sql.

In carrying out Task 2, you must not modify any data or add any further data to the tables populated by the rm-schema-insert.sql script. Design your test data to get output for the SQL scripts/queries specified below - this may require you to add further data as you complete the required tasks.

TASK 3: DML (15 marks)

Your answers for this task (Task 3) must be placed in the supplied SQL Script **T3-rm-dm.sql**

For this and *all subsequent Tasks*, **you are NOT permitted to**:

- manually look up a value in the database, obtain its primary key, or manually obtain the highest/lowest value in a column,
- manually calculate values external to the database, e.g. on a calculator and then use such values in your answers. ***Any necessary calculations must be carried out as part of your SQL code*** or
- assume any particular contents in the database - rows in a table are potentially in a constant state of change

Your answers must recognise that you are dealing with only a very small sample snapshot of a multiuser database; as such, you must operate on the basis that there will be ***more data in all of the database tables than you currently have access to. Thus, data will be in a constant state of change. Your answers must work regardless of the extra quantity of this extra "real" data and the fact that multiple users will operate in the tables simultaneously. You must consider this aspect when writing SQL statements.***

For any following SQL tasks, **your SQL must correctly manage transactions and use sequences to generate new primary keys for numeric primary key values** (a new primary key value cannot be hardcoded as a number or value).

You must ONLY use the data provided in the questions' text.

For Task 3, you must complete the following sub-tasks in the same order they are listed. Where you have been supplied with a string in italics, such as *RM AUTUMN SERIES CLAYTON 2025*, you may search in the database using the string *as listed*. Where a particular case for a word is provided, *you must only use that case (same spacing, case, etc) in your SQL code*. When a name is supplied, you may break the name into first name and last name. For example, *Farrel Grazier* can be split into Farrel and Grazier; again, note that the case must be maintained as it was supplied. **Failure to adhere to these requirements, such as changing the case of a provided string, will result in a grade penalty**.

(a) Oracle sequences will be implemented in the database to insert records for the COMPETITOR and TEAM tables.

Provide the CREATE SEQUENCE statements to create sequences that could be used to provide primary key values for the COMPETITOR and TEAM tables. These sequences must start at 100 and increment by 5. Immediately before the create sequence commands, place appropriate DROP SEQUENCE commands so that the sequences will be dropped before being created if they exist. Please note that these are the ONLY sequences that can be introduced and used in Task 3.

[1 mark]

Tasks 3b - 3d are potentially related questions. Where appropriate, you can use the information given in any of the parts to answer any question e.g. use the information in (b) to help answer (c) and/or (d).

(b) Record two competitors named *Keith Rose* (phone number: *0422141112*) and *Jackson Bull* (phone number: *0422412524*). Both of them are Monash students.

Both of them have indicated that they would like to participate in *RM WINTER SERIES CAULFIELD 2025* carnival and enter the *10 km run* event. For this carnival, Keith will support the *Salvation Army* charity, and Jackson will raise funds to support the *RSPCA* charity.

Keith also indicated that both of them would like to form a team called *Super Runners* for the carnival. Run Monash staff check and confirm that the team name is not currently in use for this carnival. So they inform Keith that such a team can be created and note Keith as the team leader and Jackson as a member of the team.

Make these changes to the data in the database. You may make up sensible data for the rest of the attributes. The full set of actions to satisfy (b) must either all be recorded in the database or none of the changes should be recorded.

[8 marks]

(c) One day later, *Jackson Bull* indicated that he would like to downgrade his event for the *RM WINTER SERIES CAULFIELD 2025* carnival from the *10 km run* to the *5 km run* and change his supported charity from *RSPCA* to *Beyond Blue*.

Make these changes to the data in the database.

[2 marks]

(d) One week later, *Keith Rose* indicated that due to personal schedule conflict, he would like to withdraw from the *RM WINTER SERIES CAULFIELD 2025* carnival. As a consequence, the *Super Runners* team should be disbanded and removed from the system. *Jackson Bull* will still participate in the carnival as an individual runner.

Keith Rose also indicated that he is looking forward to competing in the next 2025 carnival.

Make these changes to the data in the database.

[4 marks]

TASK 4: DATABASE MODIFICATIONS (10 marks)

Your answers for these tasks (Task 4) must be placed in the supplied SQL script **T4-rm-mods.sql**

The required changes must be made to the "live" database (the database *after* you have completed tasks 1, 2 and 3, in which other users must be assumed to be active). You MUST not edit and execute your schema file again. Before completing the work below, please ensure you have completed tasks 1, 2 and 3 above.

In completing this task, you **must**:

- if you need to add new columns, tables or related constraints, follow the naming conventions used in the data models and schema file which have been provided,
- provide column comments for any new columns that you add, and
- correctly manage any transactions used as part of your solution

(a) Run Monash wants to store the number of completed events for each competitor. Add a new attribute to the database to meet this requirement. You must populate the new attribute based on the current data in the database at the time you add the new attribute.

As part of your solution, provide appropriate select and desc statements to show the changes you have made. Select to show any data changes that have occurred and desc tablename e.g. desc customer to show any table structural changes.

[3 marks]

(b) Some competitors have indicated that they would like to support more than one charity in future carnivals. They also wish to indicate the percentage (0 to 100) of the total funds that they raise that will go to each charity.

For example, *Jackson Bull* supports the *RSPCA and Beyond Blue* charities in the *RM WINTER SERIES CAULFIELD 2025* carnival. 70% of the funds raised will be donated to the RSPCA, and the remaining 30% will be donated to *Beyond Blue*.

Change the database to satisfy this requirement. As part of your solution, provide appropriate select and desc statements to show the changes you have made. Select to show any data changes that have occurred and desc tablename, e.g. desc customer to show any table structural changes.

[7 marks]

TASK 5: PL/SQL (20 marks)

Your answers for this task (Task 5) must be placed in the supplied SQL script **T5-rm-plsql.sql. Before completing the work below, please ensure you have completed tasks 1, 2, 3 and 4 above.**

For each of these PL/SQL questions, as part of your answer, you must create a set of SQL commands that will demonstrate the successful operation of your function/trigger/stored procedure (a test harness) - these tests are part of the awarded marks for each question. Place these commands below your function/ trigger/stored procedure definition for each task. **You may do a manual look-up** when writing the test harness.

Ensure your function/trigger/stored procedure definition finishes with a slash(/) followed by a blank line as detailed in the PL/SQL workshop and the applied class materials. In addition, you must provide error/output messages where appropriate.

(a) Create a function to calculate the elapsed time. The function must take the start time and finish time as input parameters, and return the elapsed time.

[3 marks]

(b) From this point onwards, RM wants to automatically maintain elapsed time and ensure other data consistency/integrity when a runner has completed an event. Create **one** trigger to implement this business rule.

[6 marks]

(c) Write **one** stored procedure called **prc_entry_registration** that handles the registration of a competitor for an event in a carnival (i.e. an entry). The procedure must only handle one registration at a time.

You must read the brief carefully to identify the business requirements that you have to handle within the procedure. You must also consider these additional business rules:

- each competitor can only nominate one charity when they register for the event
- if the inputted team name does not exist, a new team will be created, and the competitor's details will be stored as the team leader
- if the inputted team name exists in the system, the competitor is included as a member of the existing team.

The procedure requires:

- Five input parameters (you must **not** change the parameter order)
    1. competitor number
    2. carnival name (e.g. *RM WINTER SERIES CAULFIELD 2025*)
    3. event type description (e.g. *5 km Run*)
    4. team name (e.g. *Super Runners*)
    5. supported charity name (e.g. *Amnesty International*)
- One output parameter

[11 marks]

TASK 6: MongoDB (15 marks)

Your answers for this task (Task 6) must be placed in the supplied sql file **T6-rm-json.sql** and the supplied MongoDB script file **T6-rm-mongo.mongodb.js.**

(a) Write an SQL statement in **T6-rm-json.sql** to generate a *collection* of JSON documents using the following structure/format from the Run Monash tables (code/run this after task 5). Each document in the collection represents a team and contains the list of the team members and their entry details.
Notes:
- Where you need to show a full name, you must not have any extra spaces (e.g., leading space or extra space in the middle of the name)
- If a field is null, it must be printed as "-"


```
[
   {
          "_id": 1,
          "carn_name": "RM Spring Series Clayton 2024",
          "carn_date": "22-Sep-2024",
          "team_name": "Champions",
          "team_leader": {
              "name": "Rob De Costella",
              "phone": "0422888999",
              "email": "rob@gmail.com"
          },
          "team_no_of_members": 4,
          "team_members": [
              {
                   "competitor_name": "Jane Ryan",
                   "competitor_phone": "0453243132",
                   "event_type": "5 Km Run",
                   "entry_no": 2,
                   "starttime": "09:31:04",
                   "finishtime": "10:02:22",
                   "elapsedtime": "00:31:18"
               },
               {
                   "competitor_name": "Cathy Freeman",
                   "competitor_phone": "0422666777",
                   "event_type": "10 Km Run",
                   "entry_no": 1,
                   "starttime": "08:30:57",
                   "finishtime": "09:38:08",
                   "elapsedtime": "01:07:11"
               },
               {
                   "competitor_name": "Rob De Costella",
                   "competitor_phone": "0422888999",
                   "event_type": "10 Km Run",
                   "entry_no": 2,
                   "starttime": "08:32:05",
                   "finishtime": "09:27:06",
```

```
                "elapsedtime": "00:55:01"
            },
            … <<only some team members shown>>
        ]
    },
    … <<only one team's data shown>>
]
```

[8 marks]

Write the MongoDB commands for the following questions, 6(b) - 6(d), in the supplied MongoDB script file named **T6-rm-mongo.mongodb.js**.

You must not add any further comments to the supplied MongoDB script file nor remove/rename any comments indicated by //
Only use the solution space to enter your answer, ENSURE every statement ends with a ;

(b) Create a new collection and insert all documents generated in 6(a) above into MongoDB. Provide a drop collection statement right above the create collection statement. You may pick any collection name. After the documents have been inserted, use an appropriate db.find command to list all the documents you added.

[1 mark]

(c) List the carnival date, carnival name, team name and team leader's name for all teams with one or more competitors who competed in either the *5 Km Run* or the *10 Km Run* events in that carnival. You must ensure that the query returns some output. If you need to add further data for this task, you must return and add it as part of task 2 and then rerun rm-schema-insert.sql and all tasks (tasks 1, 2, 3 and 4) before running task 6.

[2 marks]

(d) A competitor named *Jackson Bull* (phone number: *0422412524*) decided to form a team named *The Great Runners* for the *RM WINTER SERIES CAULFIELD 2025* carnival that will be held on *29-Jun-2025*. At this point, Jackson is the sole team member and is recorded as the team leader, registering for the *5 Km Run* event. You may manually decide the _id, email and entry_no.

(i) Write the necessary MongoDB commands to add this new team to the collection. Use an appropriate db.find command which shows only the details of *The Great Runners* team after making the change so that you show/confirm the change which was made.

Another competitor named *Steve Bull* (phone number: *0422251427*) decided to join Jackson's team which was created in (i). Steve is registering for the *10 Km Run* event.

(ii) Write the necessary MongoDB commands to add this new team member into the existing team within the collection. Use an appropriate db.find command which shows only the details of *The Great Runners* team after making the change so that you show/confirm the change which was made.

[4 marks]

Submission Requirements

Due Date: **Monday, 9th June 2025 at 4:30 pm**

*Please note that if you need to resubmit, you **cannot** depend on your staff's availability; therefore, please be VERY CAREFUL with your submission.* **It is strongly recommended that you submit several hours before this time to avoid such issues.**

For this assignment, there are seven files you are **required** to submit to Moodle:

- T1-rm-schema.sql
- T2-rm-insert.sql
- T3-rm-dm.sql
- T4-rm-mods.sql
- T5-rm-plsql.sql
- T6-rm-json.sql
- T6-rm-mongo.mongodb.js

If you need to comment to your marker/tutor, please place them at the head of each of your solution scripts/answers in the "Comments for your marker:" section.

Do not zip these files into one zip archive; submit seven independent SQL scripts. The individual files must also have been pushed to the FIT GitLab server with an appropriate history as you developed your solutions.

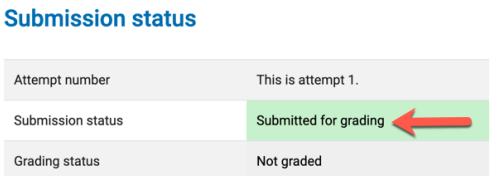
Late submission will incur penalties of -5 marks for every 24 hours the submission is late.

The seven files must also exist in your FITGitLab server repo and *show a clear development history* (at least two pushes per file).

Please note we **cannot mark any work on the GitLab Server**; you must ensure that you submit correctly via Moodle, since it is only in this process that you complete the required student declaration, without which work **cannot be assessed**.

It is your responsibility to ENSURE that the files you submit are the correct ones. We strongly recommend that you download the submission and double-check its contents after uploading it, before you submit to Moodle.

Your assignment **MUST** show a "Submitted for grading" status before it will be marked.



If your submission shows a status of "Draft (not submitted)" it will not be assessed and **will incur late penalties after the due date/time**.

Marking Guide

The submitted code will be assessed against an optimal solution for these tasks. In some tasks where SQL is involved, several alternative approaches are often possible. Such alternatives will be graded based on the code successfully meeting the brief's requirements. If it does, the answer will be accepted and graded appropriately.

Marking Criteria	Items Assessed
TASK 1 DDL 15 marks	
DDL Creation of tables	**Maximum 7 marks - Create table:** ● Marks awarded for correct table DDL ● Marks awarded for correct attributes/data types ● Marks awarded for correct PK definition ● Mark penalty applied if different table/attribute names used than expressed in the supplied data model ● Mark penalty applied if different order of attributes used than expressed in the supplied data model ● No marks awarded if generated schema used
DDL implementation of non-PK database constraints	**Maximum 8 marks - Non-PK Constraints:** ● Marks awarded for correct implementation of non-PK constraints ● Marks awarded for correct use of column comments
TASK 2 Data Insert 20 marks	
Insert of required items test data	**Maximum 10 marks- Insert of data:** ● Marks awarded for correct insert of required data ● Marks awarded for correct management of transactions
Insert of valid test data	**Maximum 10 marks - Valid data inserted:** ● Marks awarded for validity of data inserted ○ meets the requirements expressed in the assignment brief ● Marks awarded for correct management of dates when inserting
Task 3 DML 15 marks	
	Maximum 15 marks - Satisfy brief requirements: ● Marks awarded (a) - (d) for SQL code which meets the expressed requirement ● Mark penalty applied if commit not used appropriately

	● Mark penalty applied if date handling and string database lookups not managed correctly
Task 4 Database Modifications 10 marks	
	Maximum 10 marks - Satisfy brief requirements: ● Marks awarded (a) - (b) for SQL code which meets the expressed requirement (including appropriate use of constraints). In making these modifications there must be no loss of existing data or data integrity within the database. ● Mark penalty applied if commit not used appropriately ● Mark penalty applied if column comments not used where required
Task 5 PL/SQL 20 marks	
	Maximum 20 marks - Satisfy brief requirements: ● Marks awarded (a) - (c) for PL/SQL code which meets the expressed requirement. ● Marks awarded for writing a test harness for each question (a) - (c) which includes both successful and failed tests (all errors your code raises must be tested). ● Mark penalty applied if no output messages are provided where appropriate ● Statements which do not execute correctly in Oracle (ie. returns syntax error) will be awarded a maximum of 50% of the available marks less 1 mark. For example, if a question is worth 6 marks and runs with an error in SQL the *maximum* mark awarded will be 2 marks. ***Note that the error generated by drop or raise_application_error commands is an expected error and there will be no penalty on this.***
Task 6 Non Relational Database Queries - MongoDB 15 marks	
	Maximum 15 marks - Satisfy brief requirements: ● Maximum of 8 marks awarded for creation of a JSON document which matches the supplied document format ● Marks awarded, as listed, (b) - (d) for MongoDB code which meets the expressed requirement ● Mark penalty applied if field names and predicates (such as "&eq") are not enclosed in double quotes ● Statements which do not execute correctly in MongoDB will be awarded a maximum of 50% of the available marks less 1 mark. For example, if a question is worth 6 marks and runs with an error in MongoDB the *maximum* mark awarded will be 2 marks

Correct use of Git 5 marks	
	• Marks awarded for a minimum of fourteen pushes (**two per file**) showing a clear development history of the work for Assignment 2 • Marks awarded for correct Git author details used in pushes • Marks awarded for the use of meaningful commit messages (i.e. not blank or of the form "Push1")
Penalties	
Use of • VIEWs • SET ECHO or SPOOL commands, and/or • PL/SQL	Use of VIEWS, inclusion of SET ECHO/SPOOL, and/or PL/SQL commands except in Task 5 will result in a ***grade deduction of 10 marks being applied.*** **SET SERVEROUTPUT ON, SET ECHO ON and PL/SQL can only be used in Task 5. Do NOT include set echo off in any task.**
Incorrect file names	If file names do not follow the requirement (i.e., they are changed from the supplied filenames) or if a zip file is submitted instead of seven individual files, a ***grade deduction of 5 marks will be applied****.*
Late submission	**-5 marks for each 24 hours late or part thereof**

Final Assignment Mark Calculation

Total: 100 marks, recorded as a grade out of 40