Assignment 2: SQL

INDIVIDUAL PROJECT (10%)

The Case

You are the SQL programmer for supermarket chain which has several stores in various suburbs of Melbourne. The checkout system uses an OLTP database which stores data about purchases made. Your job is to write SQL queries that answer questions posed by management.

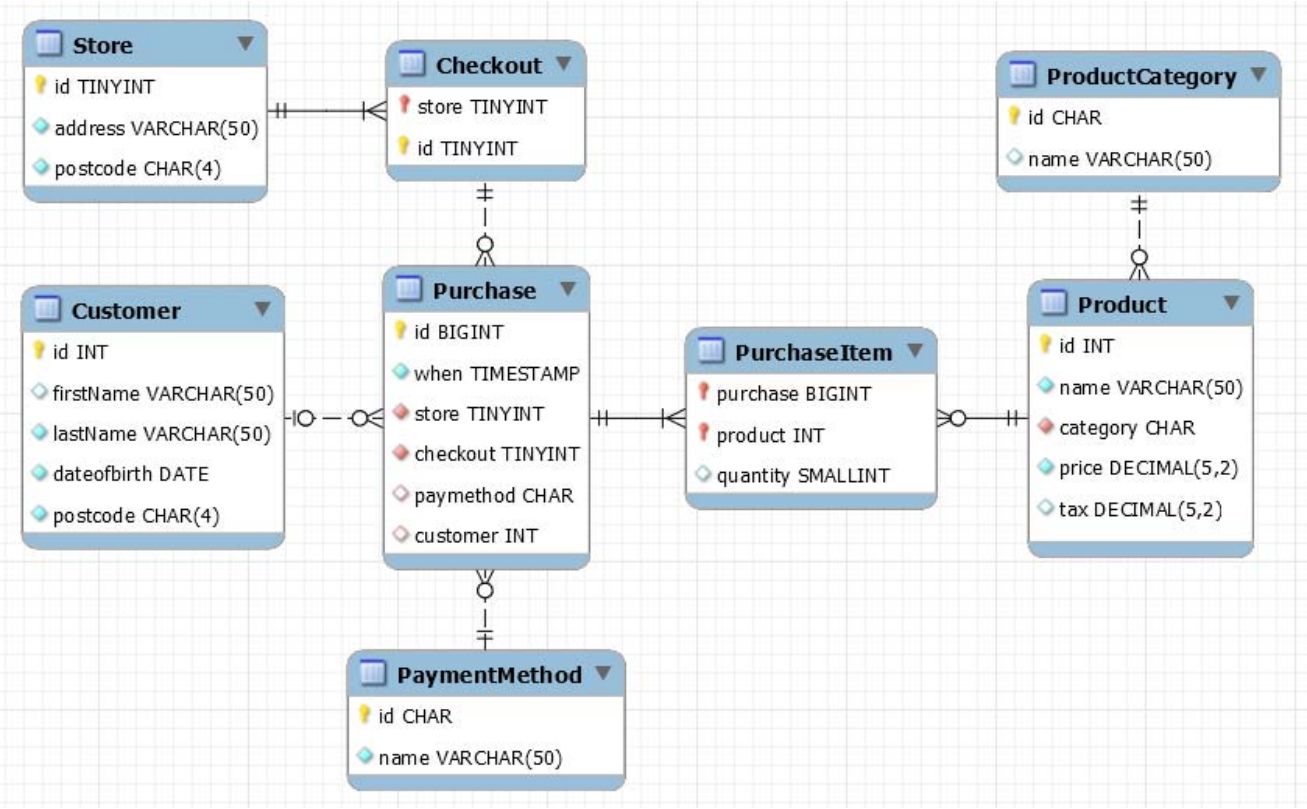
Our customers take a collection of products to a checkout for scanning: this collection is one "Purchase". Each item within the purchase is a "PurchaseItem". Some customers identify themselves at the checkout by scanning a loyalty card.

The checkouts are numbered within each store: so a given store n has checkouts n-1, n-2 etc. In a given store, checkout 1 is the 'first' checkout; the checkout with the highest number is the 'last'.

Each product is classified within a particular category. There are several payment methods.

Data model

The following ER diagram describes the database schema which has been implemented.



Setup Script

To set up the database in your MySQL server, download the file Assignment2Setup.sql from LMS and run it in Workbench. This script creates the schema and database tables and populates them with data. (Note the comments near the start of the script – it is different depending on whether you run it on the UniMelb server or your own computer.)

The SQL queries required

In this section are listed 10 questions for you to answer. Write ***one*** SQL statement per question. Do *not* use *views* or *temporary tables* to answer the questions. Where it would improve readability, order your output and use aliases. Format large numbers and fractions appropriately.

Beside each question is a maximum mark which reflects the difficulty of that question.
Your total score will be scaled to 10% of your overall marks in the subject.

Your work will be assessed on the correctness and simplicity of the SQL that you write. (A query that produces correct output but is more complex than it needs to be, for example joining more tables than is necessary, may not achieve full marks, even if it produces the correct results.)

1. Which is the longest customer lastname that contains the letter 'E' ? (1 mark)

2. List the names and prices of all ‘food’ items that cost more than $3.
Order them by descending order of price. (1 mark)

3. Print a list of all customers, showing full names and the total amount each has spent.
Order by amount spent, with the biggest spender at the top. (2 marks)

4. List any products that have not been purchased on a weekend (Saturday or Sunday).
Show their id and name. (3 marks)

5. Which product category has yielded the biggest income in postcode 3010? (3 marks)

6. List the products that have been bought in at least half of the stores. (3 marks)

7. What is the average number of items that purchases contain?
Show also the standard deviation. (3 marks)

8. Have any customers under the age of 30 bought an iron?
Show their name and age in years. (4 marks)

9. List the names of any customers who have used all payment methods. (5 marks)

10. How many purchases were made at the "last" checkout in a store? (5 marks)

Submission

Submit a single PDF showing your ten answers to LMS by midnight on the due date of Monday 18th September, at the start of week 9.

Ensure that you place your username and student number at the top of every page of your submission.

For each question, present an answer in the following format:

- Show the question number and question in black text.
- Show your answer (the SQL statement) in blue text **(not a screen shot)**
- Show a screenshot from Workbench showing output of 10 or fewer lines.
- Show how many rows were returned, in red text

For example:

7. List all users with the last name 'Altman'

```
SELECT *
FROM User
WHERE lastName = 'Altman';
```

Id	FirstName	LastName
1376	Robert	Altman
2880	Mark	Altman
10308	Robert	Altman
21472	Harry	Altman
21722	Robert	Altman

5 Rows Returned

SQL queries must be formatted in an easy-to-read manner. This means writing keywords in all-caps, placing most clauses on new lines, and indenting subqueries. For example, this is acceptable:

```
SELECT DISTINCT ItemID
FROM Sale
WHERE DepartmentID IN
        (SELECT DepartmentID FROM Department
        WHERE Department.DepartmentID = Sale.DepartmentID
        AND DepartmentFloor = 2);
```

whereas this is not acceptable:

```
select distinct itemid from sale where departmentid in (select departmentid from department where department.departmentid = sale.departmentid and departmentfloor = 2);
```

Academic Honesty

This assignment must be your own work. Plagiarism - the copying of another's work without proper acknowledgment - is not permitted. Nor is allowing another person to copy your work. Work submitted for assessment purposes must be the independent work of the student concerned. Please refer to http://academichonesty.unimelb.edu.au/ for details about academic honesty.

Academic misconduct occurs when students portray someone else's work as their own. There are many ways in which academic misconduct can occur. Some of these are:

- **Sham Paraphrasing**: Material copied verbatim from text and source acknowledged in-line but represented as paraphrased.
- **Illicit Paraphrasing**: Material paraphrased from text without in-line acknowledgement of source.
- **Other Plagiarism**: Material copied from another student's assignment with the knowledge of the other student.
- **Verbatim Copying**: Material copied verbatim from text without in-line acknowledgement of the source.
- **Recycling**: Same assignment submitted more than once for different subjects.
- **Ghost Writing**: Assignment written by third party and represented as own work.
- **Purloining**: Assignment copied from another student's assignment or other person's papers without that persons knowledge.

The University is committed to graduating students with "a profound respect for truth, and for the ethics of scholarship... we want our graduates to be capable of independent thought, to be able to do their own work, and to know how to acknowledge the work of others" (Professor Peter McPhee). As such, the university takes a dim view of students who are not able to correctly acknowledge the work of others, or who try to pass this work off as their own. All students should be aware of the following web site: http://academichonesty.unimelb.edu.au/advice.html which provides practical advice to students about how not to be involved in academic misconduct. In particular look at the Quick Checklist section (paraphrased below).

Quick checklist (Reproduced with permission of Dr Stephen Morgan, Faculty of Economics and Commerce)

1. To be certain to acknowledge sources fairly and avoid plagiarising, review this checklist before beginning to write your essay and again after you have completed your first draft.
2. What type of source are you using: your own independent material, common knowledge, or someone else's independent material?
3. If you are quoting someone else's material, is the quotation exact? Have you used quotation marks for quotations run into the text? Have you set off block quotes with an extra space before and after the quote, single spacing within the quote, and left indenting of all lines of the block quote? Are omissions shown with ellipses and additions with square brackets?
4. If you are paraphrasing someone else's material, have you rewritten it in your own words and sentence structures? Does your paraphrase employ quotation marks when you resort to the author's exact language? Have you represented the author's meaning without distortion?
5. Have you acknowledged each use of someone else's material?
6. Do all references contain complete and accurate information on the sources you have cited?