# 2 Relational Data Model and SQL

# 2.1 Summary

Relational Database Management Systems (RDBMS) have become the prevalent means of managing data. RDBMS comprises of software facilitating storage, entry and data retrieval. Relational databases are organised in entities, attributes, and tuples. A tuple (or a record) is a set of attributes. An attribute contains a single piece of information, and an entity is a collection of tuples. Relations in a database are represented using entities (or tables), with rows containing unique tuples. A cell must hold one atomic value (e.g. a value that wouldn't normally be divided into any smaller parts). Values can be Text (e.g. letters or Alphanumeric characters), Numbers (so that associated mathematical operations can be performed) or other types such as Dates, Times or Currency.

Standard Query Language (SQL) is the most widely-accepted database language, supported to some extent by every database product on the market today. Data retrieval in a database is performed using queries written in a query language. A Query can be classified as a question that we require the database to provide an answer to. The Select statement is used in SQL to pull out and display information from a table. Its basic structure has this form:

```
SELECT select-list
FROM table;
```

In addition to data retrieval, SQL supports other operations for managing data. These include:

Select	Used to retrieve data from the database, the most commonly used statement
Insert	Used to enter (insert), remove (delete) or change (update) rows from
Delete	a table. Together with Select, collectively known as the DML or Data
Update	Manipulation Language
Create	Used to set up (create), change (alter) or remove (drop) data structures
Alter	such as tables, views or indexes. Collectively known as the DDL or Data
Drop	Definition Language
Grant Revoke Validate	Used to give (grant) or remove (revoke) access rights to data and data structures within an SQL database

Download free eBooks at bookboon.com

#### Exercises in this chapter are based upon the following scenario:

Dream Destinations Ltd is a company that provides a top quality service in bespoke, tailor-made holiday packages. They arrange everything from flights, hotel accommodation and trips to destinations within the Caribbean. At present they only record data from phone calls and e-mails on paper note pads and these are put inside filing cabinets. They have no methods for storing customer, hotel or flight information and have difficulty in keeping track of information. They only advertise by word of mouth, cold calling telesales and advertising through print media such as their own travel brochure which can be found in travel agents.

Dream Destinations Ltd have realised that should something happen to the paper files, e.g. an office fire, their data would be lost as they have no way of keeping data. They want to be able to access the required information quickly and efficiently. They also need a means of advertising themselves to increase their customer base. They have asked for us to create a means of storing their client, booking and property information.



Click on the ad to read more

# 2.2 Solutions to Exercises

#### 1. Display all the information in the table called client

SQL: SELECT \* FROM client;

	clientno	~	fname	-	Iname	Ŧ	telno	Ŧ	preftype	Ŧ	maxrent	-
	CR56		Aline		Stewart		0141-848-18	325	Apartment			475
	CR62		Mary		Tregear		01224-19672	20	Villa			550
	CR74		Mike		Ritchie		01475-39217	78	Studio			525
	CR76		John		Кау		0207-774-56	532	Villa			500
*												

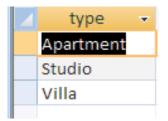
#### 2. Display the propertyno and country for each property

SQL: SELECT propertyno, country FROM property;

	propertyno 👻	country 👻
	PA14	Barbados
	PG16	Antigua
	PG21	St Kitts
	PG36	Barbados
	PG4	Barbados
	PL94	Barbados
*		

#### 3. Display all the distinct types of property

SQL: SELECT DISTINCT type FROM property;



4. Display a list of the monthly income of each rental property (calculated from yearly income / 12)

SQL: SELECT propertyno,ownerno, yearincome/12, FROM property;

	propertyno 👻	ownerno 👻	Expr1002 -
	PA14	CO46	1000
	PG16	CO87	666.666666666667
	PG21	CO40	791.666666666666
	PG36	CO93	922.9166666666667
	PG4	CO87	1170.833333333333
	PL94	CO93	1250
*			

Download free eBooks at bookboon.com

### 5. Display a list of the distinct property locations

SQL: SELECT DISTINCT country FROM property;

country	-
Antigua	
Barbados	
St Kitts	

# 6. Display the property number, and the new rent figure given a 12% rise in the rent figure. Name the new column increase

SQL: SELECT propertyno, (rent/100\*12)+rent AS increase FROM property;

	propertyno 👻	increase 👻
	PA14	560
	PG16	448
	PG21	504
	PG36	532
	PG4	588
	PL94	616
*		

7. Display the first name and last name of each client as a single column separated by a hyphen (name the column clientname), along with new rent figure given a 5% increase in the maximum rent figure (name the new column newmax)

SQL:SELECT fname&"-"&Iname AS clientname, (maxrent/100\*5)+maxrent AS newmax , FROM client;

Download free eBooks at bookboon.com