T9

Databases

CHAPTER ASSIGNMENT · 34 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use the chapter page to help you.

Questions from *Cambridge IGCSE and O Level Computer Science*, 2nd edition, David Watson and Helen Williams (Hodder Education), for classroom use.

Activities from the chapter

9.1 State what fields would you expect to find in each record for the doctor's appointments and give each field a suitable name. Note: Field names should be a single word, which should not contain any spaces, for example: **BedNumber**

9.2 Using Access (or any other suitable database management software), set up a single table database to store the PATIENT records using the fields given previously: **FirstName**, **FamilyName**, **DateOfAdmission**, **Consultant**, **WardNumber**, **BedNumber.** » Choose a suitable data type for each field. » Include validation checks to make sure that the ward number has whole number values from 1 to 10, and that the bed number has whole number values from 1 to 8. » Enter the following data in the PATIENT table: Winnie Sing, 12/10/2022, Mr Smith, 6, 8 Steve Chow, 23/10/2022, Miss Abebe, 6, 3 Chin Wee, 30/10/2022, Mr Jones, 7, 1 Min Hoo, 1/11/2022, Mr Smith, 6, 1 Peter Patel, 12/11/2022, Mr Jones, 7, 8 Sue Sands, 19/11/2022, Miss Abebe, 6, 2 Farouk Khan, 22/11/2022, Mr Jones, 7, 4 Ahmad Teo 22/11/2022, Mr Jones, 7, 2 You may want to look at the instructions on how to set up the CubScout database later in this chapter if you have not set up a database before.

9.3 Using *Access* (or any other suitable database management software), add the **HospitalNumber** field to the single table database PATIENT. » Choose 'text' as the data type for this field. » Include validation checks to ensure that 8 characters must be entered starting with **HN** followed by **6digits** for example **HN123456**. » Choose suitable data to store in each primary key field for the 6 patients in the table.

9.4

(1) Write down **four** database data types. Describe each data type and give an example of a field where it would be a suitable choice.

(2) Choose suitable words/phrases from the following list to correctly complete the paragraph that follows: Word list: database fields records record table primary key data type validation text char Boolean field You will need to use some words more than once. A single .... contains one ..... . Each ..... consists of many ..... . Every ..... has the same number of ..... . Every ..... is given a ..... . Examples of data types are ....., ... and ..... . Some ..... will have ..... rules.

9.5

(1) Using the single table database PATIENT you have created.

(a) Write an SQL query to list all Mr Jones' patients.

(b) Write an SQL query to list all the patients not in ward 6.

(c) Write an SQL query to list all the patients who arrived on 12/11/2022.

(d) Write an SQL query to list all the patients who arrived between 12/10/2022 **AND** 30/10/2022.

(2) Write down the output from this SQL query. SELECT FirstName, FamilyName, BedNumber FROM PATIENT WHERE WardNumber = 7;

9.6

(1) Using the single table database PATIENT you have created.

(a) Write an SQL query to count the number of patients in ward 7.

(b) Write an SQL query to count the number of patients not in ward 7.

(2) Write down the output from this SQL query. SELECT HospitalNumber, FirstName, FamilyName, Consultant FROM PATIENT ORDER BY Consultant, FamilyName;

9.7

(1) Set up a cub scout database including appropriate validation checks for each field. Enter data for at least 10 records.

(a)

(b) The cub scout leader wants to put each cub into a group called a 'six'; each 'six' can have up to six cubs in it and is given a name for example red, yellow, blue and green. Add a new text field called Six, and assign each cub to either a red, blue, yellow or green six.

(i) Write an SQL query to pick out any cubs in the red six.

(ii) Write an SQL query to pick out any cubs in the red six or the blue six.

(iii) Write an SQL query to count the number of cubs in the red six.

(c) The cub scout leader wants to calculate the number of badges that all the cubs have been awarded. Add a new integer field called *Badges*, enter the number of badges awarded to each cub. Write an SQL query to count the number of badges awarded to the whole cub group.

9.8

(1) A database of students is to be set up with the following fields: » Family name » Other names » Student ID » Date of Birth » Date of Entry to School » Current Class » Current school year/grade » Email address.

(a) Select a data type for each field.

(b) Which fields should be validated, and which fields should be verified?

(c) Decide the validation rules for those fields which should be validated.

(d) Which field would you choose for the primary key?

(e) Choose a suitable format for the student ID.

(f) Build a database with at least 10 records; include all your validation checks. Ensure there are at least 3 different classes and 2 different years/grades.

(g) Set up and test SQL scripts to:

(i) Display Other names, Family and Email address in alphabetical order of family name.

(ii) Select all the students from each class in alphabetical order.

(iii) Select all the students for each year/grade and print Other names, Family name and Date of Birth, grouping the students by class.

Exam-style questions

1 A motor car manufacturer offers various combinations of: » seat colours » seat materials » car paint colours. A table, CAR, was set up as single-table database to help customers choose which seat and paint combinations were possible. (NOTE: N = no, not a possible combination, Y = yes, combination is possible)

Paint colours

Code	Cloth	Leather	Seat colour	*White*	*Red*	*Black*	*Blue*	*Green*	*Silver*	*Grey*
CB	Y	N	black	Y	Y	Y	Y	Y	Y	Y
LB	N	Y	black	N	Y	N	N	N	Y	Y
CC	Y	N	cream	N	Y	Y	Y	N	N	N
LC	N	Y	cream	N	Y	Y	Y	N	N	Y
CG	Y	N	grey	N	Y	Y	Y	Y	Y	N
LG	N	Y	grey	N	Y	N	Y	N	Y	Y
CR	Y	N	red	Y	N	Y	N	N	Y	Y
LR	N	Y	red	Y	N	Y	N	N	Y	Y
CB	Y	N	blue	N	N	N	Y	N	N	N
LB	N	Y	blue	N	N	Y	Y	Y	N	N

(a) State the number of records shown in the table. [1]

(i)

(ii) State the number of fields shown in the table. [1]

(iii) State, with a reason, if any of the fields are suitable to use as primary key. [2]

(b) The following SQL command was used: Show what will be displayed. [2]

```
SELECT Code
FROM CAR
WHERE SeatColour = 'Red' AND ('White' OR
'silver');
```

(c) A customer wanted to know all the possible combinations for a car with leather seats and either silver or grey paint colour. Complete the SQL command required. [2]

```
SELECT *
FROM .....
WHERE ..... leather AND (silver ..... grey);
```

2 A company that sells bicycles keeps records of the items in stock in a table, CYCLE, using a single-table database. For each model of bicycle, the following data is kept: – model number, for example: BY00007 – description of model, for example: lady's shopper – colour of frame, for example: gold and black – size of wheels, for example: 700 mm – price of model in $, for example: $309.50 – still being manufactured: Yes or No – number in stock. a i State, with a reason for your choice, the data type you would choose for each field in the table. [7]

(ii) Identify, with a reason for each, the validation required for each of these fields: – model number – price – number in stock. [3]

(iii) State, with a reason, the field that would be suitable to use as primary key. [2]

(b) SQL commands are used to extract data from the table. Explain, using examples from your table, how each of these commands could be used: – **SELECT** – **FROM** – **WHERE** – **SUM** – **ORDER BY** [10]

3 A database table, PERFORMANCE, is used to keep a record of the performances at a local theatre.

Show Number	Type	Title	Date	Sold Out
SN091	Comedy	An Evening at Home	01-Sep	Yes
SN102	Drama	Old Places	02-Oct	No
SN113	Jazz	Acoustic Evening	03-Nov	No
SN124	Classical	Mozart Evening	04-Dec	Yes
SN021	Classical	Bach Favourites	01-Feb	Yes
SN032	Jazz	30 Years of Jazz	02-Mar	Yes
SN043	Comedy	Street Night	03-Apr	No
SN054	Comedy	Hoot	04-May	No

(a) State the number of fields and records in the table. Fields..... Records ..... [2]

(b) Give **two** validation checks that could be performed on the Show Number field. Validation check 1..... [2]

Validation check 2.....

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End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/computer-science/o-level/databases/