HANDOUT FOR CHAPTER 13

DATABASES

Past Questions

1 A database, PROPERTY, was set up to show the prices of properties for sale and the features of each property. Part of the database is shown below.

Property Type	Brochure No	Number of Bedrooms	Number of Bathrooms	Garden	Garage	Price in $
Bungalow	B17	7	4	Yes	Yes	750,000
Apartment	A09	2	1	No	No	100,000
House	H10	4	2	Yes	No	450,000
House	H13	3	2	Yes	No	399,000
Apartment	A01	2	2	No	Yes	95,000
Apartment	A16	1	1	No	No	150,000
House	H23	3	1	No	Yes	250,000
House	H46	2	1	Yes	Yes	175,000

(a) Give the number of fields that are in each record.

.....[1]

(b) State which field you would choose for the primary key.

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Give a reason for choosing this field.

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.....[2]

(c) State the data type you would choose for each of the following fields.

Garage .....

Number of Bedrooms .....

Price in $ ..... [3]

(d) The query-by-example grid below selects all houses with more than 1 bathroom and more than 2 bedrooms.

```
SELECT PriceIn$,BrochureNoFROM PROPERTY
WHERE PropertyType="House" AND
NumberOfBedRooms>2 AND NumberOfBathrooms>1
ORDER BY PriceIn$;
```

Show what would be output.

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.....[2]

(e) Complete the query-by-example grid below to select and show the brochure number, property type and price of all properties with a garage below $200,000.

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[4]

2 A database, MARKS, was set up to record the test results for a class of students. Part of the database is shown below.

Student Name	Class ID	Maths	English	Science	History	Geography
Paul Smith	0017	70	55	65	62	59
Ravi Gupta	0009	29	34	38	41	44
Chin Hwee	0010	43	47	50	45	52
John Jones	0013	37	67	21	28	35
Diana Abur	0001	92	88	95	89	78
Rosanna King	0016	21	13	11	27	15

(a) Give the number of fields that are in each record.

.....[1]

(b) State which field you would choose for the primary key.

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Give a reason for choosing this field.

.....

.....[2]

(c) The query-by-example grid below selects all students with more than 60 marks in History or

```
SELECT StudentName FROM MARKS
WHERE History>60 OR Geography>60
ORDER BY StudentName;
```

Show what would be output.

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.....[2]

(d) Complete the query-by-example grid below to select and show the student names only of all students with less than 40 marks in both Maths and English.

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[3]

3 A database, STAFFPHONE, was set up to show the telephone extension numbers for members of staff working in a department store.

Name	Department	Extension number
Jane Smith	Toys	129
Sue Wong	Books	124
David Chow	Toys	129
Amy Tang	Household	123
Joe Higgs	Books	124
Jane Smith	Shoes	125
Adel Abur	Shoes	125
Peter Patel	Toys	129

(a) Explain why none of the fields in the database can be used as a primary key.

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.....[2]

(b) State a field that could be added as a primary key.

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Give a reason for choosing this field.

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.....[2]

(c) Use the query-by-example grid below to provide a list of all members of staff, in alphabetical order, grouped by department.

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[5]

4 A database, SOFASELECT, was set up to show the prices of suites, sofas and chairs for sale from an online furniture warehouse. Part of the database is shown below.

Description	Brochure Number	Number of Seats	Number of Pieces	Material	Colour	Price in $
Sofa	SF17	2	1	Leather	Red	950
Sofa	SF19	3	1	Vinyl	Black	1,000
Suite	SU10	4	3	Velvet	Green	1,500
Suite	SU23	5	3	Leather	Brown	950
Recliner chair	RC01	1	1	Leather	Cream	600
Chair	CH16	1	1	Vinyl	Red	250
Recliner sofa	RS23	4	1	Leather	Cream	1,200
Chair	CH10	1	1	Velvet	Red	175

(a) How many fields are in each record?

.....[1]

(b) State which field you would choose for the primary key.

.....

Give a reason for choosing this field.

.....

.....[2]

(c) State the data type you would choose for each of the following fields.

Number of Seats .....

Price in $ ..... [2]

(d) The query-by-example grid below selects all the furniture in cream leather.

```
SELECT Description,PriceIn$,BrochureNumberFROM SOFASELECT
WHERE Material="Leather" AND Colour="Cream"
ORDER BY PriceIn$ DESC;
```

Show the output from the query-by-example.

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.....[3]

(e) Complete the query-by-example grid below to select and show the brochure number, material, colour and price of all the furniture with 3 or more seats.

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[5]

5 A television (TV) store has a database table, TVSTOCK, for its new range of televisions. The table stores the screen size of each TV, whether it will show 3D, whether the screen is curved or flat, if the internet is available on the TV, if it has a built-in hard disk drive and the price. Part of the database table is shown below.

TVID	ScreenSize	3D	CurvedFlat	Internet	HDD	Price
TV80CVINT	80	YES	CV	YES	YES	$7,000.00
TV65CVINT	65	YES	CV	YES	YES	$5,000.00
TV60CVINT	60	YES	CV	YES	YES	$4,500.00
TV60FTINT	60	YES	FT	YES	YES	$4,000.00
TV55CVINT	55	YES	CV	YES	NO	$3,000.00
TV55FTINT	55	YES	FT	YES	NO	$3,500.00
TV55FTNIN	55	YES	FT	NO	NO	$3,000.00
TV50CVINT	50	YES	CV	YES	NO	$2,500.00
TV50FTINT	50	YES	FT	YES	NO	$2,000.00
TV50FTNIN	50	YES	FT	NO	NO	$1,750.00
TV42FTINT	42	YES	FT	YES	NO	$1,500.00
TV37FTINT	37	NO	FT	YES	NO	$1,200.00
TV20FTNIN	20	NO	FT	NO	NO	$800.00
TV15FTNIN	15	NO	FT	NO	NO	$400.00

(a) State the type of the field **TVID** and give a reason for your choice.

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.....[1]

(b) Complete the table with the most appropriate data type for each field.

Field name	Data type
ScreenSize	
3D	
CurvedFlat	
Internet	
HDD	
Price	

[3]

(c) Use the query-by-example grid below to provide a list of all of the curved screen TVs that have a built-in hard disk drive. Make sure the list only displays the TVID, the price and the screen size in ascending order of price.

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[5]

6 A database table, SHEEP, is used to keep a record of the sheep on a farm. Each sheep has a unique ear tag, EARnnnn; n is a single digit. The farmer keeps a record of the date of birth, the gender and the current weight of each sheep in kilograms.

a. Identify the **four** fields required for the database. Give each field a suitable name and data type. Provide a sample of data that you could expect to see in the field.

Field 1 name .....

Data type .....

Data sample .....

Field 2 name .....

Data type .....

Data sample .....

Field 3 name .....

Data type .....

Data sample .....

Field 4 name .....

Data type .....

Data sample .....

[8]

(b) State the field that you would choose as the primary key.

.....[1]

(c) Using the query-by-example grid below, write a query to identify the ear tags of all male sheep weighing over 10 kilograms. Only display the ear tags.

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[3]

7 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 Sept	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 .....

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Validation check 2 .....

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[2]

(c) Using the query-by-example grid, write a query to identify jazz performances that are not sold out. Only display the date and the title.

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[4]

8 A database table, TREES, is used to keep a record of the trees in a park. Each tree is given a unique number and is examined to see if it is at risk of dying. There are over 900 trees; part of the database table is shown.

Tree Number	Type	Map Position	Age in Years	At Risk
TN091	Acacia	A7	250	Y
TN172	Olive	C5	110	N
TN913	Cedar	B9	8	N
TN824	Banyan	A3	50	Y
TN021	Pine	D5	560	Y
TN532	Teak	C8	76	Y
TN043	Yew	B1	340	N
TN354	Spruce	D4	65	N
TN731	Elm	B10	22	Y
TN869	Oak	C9	13	N
TN954	Pine	E11	3	N

(a) State the number of fields in the table.

.....[1]

(b) The tree numbering system uses TN followed by three digits. The numbering system will not work if there are over 1000 trees.
Describe, with the aid of an example, how you could change the tree numbering system to allow for over 1000 trees. Existing tree numbers must not be changed.

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.....[2]

(c) Using the query-by-example grid, write a query to identify at risk trees over 100 years old. Display only the type and the position on the map.

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[4]

9 A shop that sells copies of movies to the public has set up a new database table called 2018MOV to store some new releases. Part of this table is given, showing the catalogue number, title, genres and available formats (Blu-ray, DVD or streaming) of each movie.

CatNo	Title	Genre 1	Genre 2	Blu-ray	DVD	Stream
18m01	Battery Rangers	Adventure	Fantasy	Yes	No	Yes
18m02	Golfwatch	Comedy	Drama	Yes	No	Yes
18m03	Chair 27	Comedy	Drama	Yes	Yes	No
18m04	Wander Woman	Action	Fantasy	Yes	No	Yes
18m05	Justine League	Action	Fantasy	Yes	Yes	Yes
18m06	That	Horror	Thriller	Yes	Yes	No
18m07	Insect Dude	Action	Fantasy	No	Yes	No
18m08	Dover Beach	Action	History	No	Yes	No
18m12	Slow 25	Action	Thriller	No	Yes	No
18m15	Kongkers	Adventure	Fantasy	No	Yes	No
18m16	Transducers: The Last Night	Action	Sci-Fi	Yes	Yes	Yes
18m17	The Pale Tower	Fantasy	Sci-Fi	Yes	Yes	No
18m19	Bea and the Bute	Fantasy	Romance	Yes	Yes	Yes
18m21	The Daddy	Action	Fantasy	No	No	Yes
18m22	Planet Wars: Episode X	Sci-Fi	Action	Yes	No	Yes
18m23	Guardians of the Milky Way	Action	Sci-Fi	Yes	Yes	Yes
18m26	Odin	Horror	Sci-Fi	No	Yes	Yes
18m27	That	Fantasy	Sci-Fi	No	No	Yes
18m30	Underneath	Action	Horror	Yes	No	No
18m31	Debatable Me	Animation	Action	Yes	Yes	No

(a) State the number of records in this part of the table.

.....[1]

(b) **(i)** Give the name of the field that should be used for the primary key.

.....[1]

(ii) State the reason for choosing this field for the primary key.

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.....[1]

(c) Complete the table to show the most appropriate data type for each field based on the data shown in the table at the start of question 6.

Field	Data type
CatNo	
Title	
Genre 1	
Stream	

[2]

(d) List the output that would be given by this query-by-example.

```
SELECT CatNo, Title, Blu-ray,DVD, Stream FROM
2018MOV WHERE Genre1="Comedy";
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[2]

(e) Using the query-by-example grid, write a query to identify all the movies that are categorised as Sci-Fi and available to stream. Only display the catalogue number and title of the film, with the titles listed in alphabetical order.

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[4]

10 The table, BEVERAGES, shows the number of calories in 100 ml of a range of popular beverages. It also shows the availability of these drinks in a can, a small bottle and a large bottle.

BevNo	BevName	Calories	Can	Small Bottle	Large Bottle
Bev01	Cola	40	Yes	Yes	Yes
Bev02	Lime	45	Yes	No	Yes
Bev03	Energy Drink 1	52	Yes	Yes	No
Bev04	Energy Drink 2	43	Yes	No	No
Bev05	Mango	47	Yes	No	Yes
Bev06	Lemon Iced Tea	38	Yes	No	Yes
Bev07	Lemonade	58	Yes	Yes	Yes
Bev08	Orange Juice	46	Yes	Yes	No
Bev12	Apple Juice	50	Yes	Yes	No
Bev15	Chocolate Milk	83	Yes	Yes	No

(a) Give a reason for choosing BevNo as the primary key for this table.

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..... [1]

(b) State the number of records shown in the table BEVERAGES.

..... [1]

(c) List the output that would be given by this query-by-example.

```
SELECT BevNo,BevName FROM BEVERAGES
WHERE Can="Yes" AND SmallBottle="Yes" AND
LargeBottle="Yes"
ORDER BY BevName DESC;
```

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[3]

(d) Complete the query-by-example grid to output a list showing just the names and primary keys of all the beverages with a calorie count greater than 45. The list should be in alphabetical order of names.

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[4]

11 A database table, FLIGHT, is used to keep a record of flights from a small airfield. Planes can carry passengers, freight or both. Some flights are marked as private and only carry passengers.

Flight number	Plane	Notes	Departure time	Passengers
FN101	Caravan 1	Private passenger flight	08:00	Y
CN101	Caravan 2	Freight only	08:30	N
CN102	Piper 1	Freight only	09:00	N
FN104	Piper 2	Passengers only	09:20	Y
FN105	Piper 1	Freight and passengers	10:00	Y
FN106	Caravan 1	Passengers only	10:30	Y
CN108	Caravan 2	Freight only	08:00	N
CN110	Lear	Private passenger flight	08:00	Y

(a) State the field that could have a Boolean data type.

Field ..... [1]

(b) A query-by-example has been written to display just the flight numbers of all planes leaving after 10:00 that only carry passengers.

```
SELECT Passengers FROM FLIGHT

WHERE Passengers = "Y" AND
DepartureTime="10:00";
```

Explain why the query-by-example is incorrect, and write a correct query-by-example.

Explanation .....

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SQL Statements

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[7]

12 A database table, TRAIN, is used to keep a record of train departures from a station.

Train Number	Platform	Destination	Departure Time	Status
1A37	1	Newtown	08:00	On time
2X19	2	Anytown	08:10	Late
1A29	1	Bigcity	08:15	On time
1A28	2	Anytown	08:30	Cancelled
1A67	3	Gardenvillage	08:45	On time
1A37	1	Newtown	08:50	On time
1A24	2	Charter Train	09:00	Late
1A67	3	Gardenvillage	09:15	On time

(a) Explain why the field **Train Number** could not be used as a primary key.

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..... [1]

(b) A query-by-example has been written to display only the train numbers and platforms of all trains leaving after 08:30 that are late.

```
SELECT PlatForm FROMTRAIN WHERE(
 PlatForm="Y" AND DepartureTime<08:30) OR
Status="Late";
```

Explain why the query-by-example is incorrect, and write a correct query-by-example.

Explanation .....

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SQL Statement

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[7]

13 A garden centre sells garden tools and stores details of these in a database table named TOOLS. **Code** is the primary key in the TOOLS table.

Code	Description	Price ($)	Quantity_Stock	Quantity_Ordered
GFLG	Garden Fork	50.00	1	50
GSLG	Garden Spade	50.00	11	0
GHLG	Garden Hoe	45.00	8	0
HFSM	Hand Fork	9.99	42	0
HSSM	Hand Spade	9.99	40	0
HWSM	Hand Weeder	9.99	11	0
HS20	Hose (20 metres)	45.00	10	0
HS35	Hose (35 metres)	60.00	2	0
HS50	Hose (50 metres)	75.00	20	60
YBLG	Yard Brush	24.99	100	0
LMHD	Lawn Mower	99.99	5	0
LMBT	Lawn Mower (Battery)	249.99	7	0
LMPT	Lawn Mower (Petrol)	349.99	10	25
TRBT	Edge Trimmer (Battery)	79.99	15	0
TRPT	Edge Trimmer (Petrol)	59.99	20	0
SHSM	Shears	40.00	40	0
HCSM	Hedge Clippers	40.00	45	0

(a) State the purpose of the primary key in the TOOLS table.

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..... [1]

(b) List the output from the data shown in the table TOOLS that would be given by this query-by-example.

```
SELECT Code,Description,Quantity_Ordered FROM
TOOLS WHERE Price($)>40 AND Quantity_Stock>0 AND
QUantity_Ordered>0 ORDER BY Quantity_Ordered DESC;
```

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..... [3]

(c) Complete the query-by-example grid to output the tools where the quantity in stock is below 25. Only show the Code, Description and Quantity_Stock fields in ascending order of Code.

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[3]

14 A database table, JUICE, is used to keep a record of cartons of fresh fruit juice available for sale.

Juice code	Fruit 1	Fruit 2	Size	Volume (ml)	Stock level
LMO10	Mango	Orange	Large	1000	18
MOO05	Orange	Orange	Medium	500	8
SAM02	Apple	Mango	Small	200	25
SAA02	Apple	Apple	Small	200	50
SPP02	Pineapple	Pineapple	Small	200	10
MMM05	Mango	Mango	Medium	500	12
LMM10	Mango	Mango	Large	1000	5
MGG05	Guava	Guava	Medium	500	5
SMO02	Mango	Orange	Small	200	7
MOP05	Orange	Pineapple	Medium	500	12
LAA10	Apple	Apple	Large	1000	32
SGO02	Guava	Orange	Small	200	10
LPP10	Pineapple	Pineapple	Large	1000	3
LOO10	Orange	Orange	Large	1000	25
SOO02	Orange	Orange	Small	200	40

(a) Identify a suitable field to use as the primary key. State a reason for your choice.

Field .....

Reason .....

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[2]

(b) Complete the query-by-example grid to display only the stock level and size of all cartons containing only apple juice.

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[4]

15 A convenience store which sells general groceries wants to set up a database table called STOCK. The table will contain fields including a description of the item, the price of the item and the number in stock for each item. The STOCK table also has a fourth field to be used as a primary key.

a. Complete the table to suggest a suitable field name for each of the **four** fields in the table STOCK. Give the purpose of the data to be stored in each field.

Field name	Purpose of field contents

[4]

(b) Complete the query-by-example grid to output stock items where the quantity in stock has fallen below 20. Only show the primary key and description of the items.

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[3]