

## 2.3 Databases

Wednesday, 2 December 2020 6:30 PM



2.3

Databases



**Zak**  
ZAFAR ALI KHAN

**Computer Science 2210**

Topical Past Papers

Topic: 2.3 Databases

May/June 2015.P21

- 7 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

STRNG STRNG INT INT Bool Bool CURR.

- (a) Give the number of fields that are in each record. *7 fields* [1]

- (b) State which field you would choose for the primary key. *Brochure No*

Give a reason for choosing this field. *Because data items in every record are unique.* [2]

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

Garage *Boolean*

Number of Bedrooms *Int*

Price in \$ *Curr.* [3]

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

Field:	Property Type	Number of Bedrooms	Number of Bathrooms	Price in \$	Brochure No
Table:	PROPERTY	PROPERTY	PROPERTY	PROPERTY	PROPERTY
Sort:				Ascending	
Show:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	= 'House'	>2	>1		
or:					

Show what would be output.

399000, H13  
450000, H10

[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.

Field:	BrochureNo	Property Type	Price in \$	Garage
Table:				
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:			<200000	=Yes
or:				

[4]



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May/June 2015 P22

- 6 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.

7 fields.

[1]

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

Class ID

Give a reason for choosing this field.

-Uniquely identifies every student

-Data is unique in every record.

[2]

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

Field:	Student Name	History	Geography
Table:	MARKS	MARKS	MARKS
Sort:	Ascending		
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:		>60	
or:			>60

Show what would be output.

Diana Atchar  
Paul Smith

[2]

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### Topic: 2.3 Databases

(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.

Field:	Student Name	MATH	ENGLISH
Table:	MARKS	MARKS	MARKS
Sort:			
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:		<40	<40
or:			

[3]

Oct/Nov 2015 P22

- 6 A picture gallery owner has decided to set up a database to keep information about the pictures he has for sale. The database table, PICTURE, will contain the following fields:

Title; Artist; Description; Catalogue Number; Size (area in square centimetres); Price; Arrived (date picture arrived at gallery); Sold (whether picture is already sold)

(a) (i) State what data type you would choose for each field.

Title ..... STRING

Artist ..... STRING

Description ..... STRING

Catalogue Number ..... STRING } - PK

Size ..... INT

Price ..... CURR

Arrived ..... DATE

Sold ..... BOOLEAN

[4]

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

[1]

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- (b) Give a validation check that you can perform on each of these fields. Each validation check must be different.

Catalogue Number .....

Size .....

Price .....

Arrived .....

[4]

- (c) Complete the query-by-example grid below to select and show the Catalogue Number, Title and Price of all unsold pictures by the artist 'Twister'.

Field:	CatalogueNumber	Title	Price	Sold	Artist
Table:	PICTURES	PICTURE	PRICE	PICTURE	PICTURES
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:			=False	=Twister	"Twister"
or:					

Q1 Nov 2015 P23

# False  
# True #  
"Zafar"

[5]

- 5 A motor boat hire company decides to set up a database to keep information about boats that are available for hire. The database table, BOAT, will contain the following fields:

Boat Name; Model; Engine Power (in hp); Number of Seats; Life Raft (whether there is a life raft kept on the boat); Day Price (price for a day's hire).

- (a) Give the data type you would choose for each field.

Boat Name String

Model String

Engine Power INT

Number of Seats INT

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Life Raft BOOLEAN

Day Price EURY

[3]

- (c) Complete the query-by-example grid below to select and show the Boat Name, Model and Day Price of a day's hire for all boats with 4 seats and an Engine Power of more than 100 hp.

Field:	BoatName	Model	DayPrice	NumberofSeat	EnginePower
Table:	BOAT	BOAT	BOAT	BOAT	BOAT

Sort:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				=4	7/100
or:					

[5]

May/June 2016 P21

- 6 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.

[2]

- all fields have duplicate values.

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

Staff ID

Give a reason for choosing this field.

[2]

Asterisk

A-Z

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

Field:	Name	Department		
Table:	STAFFPHONE	STAFFPHONE		
Sort:	Ascending	Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

May/June 2016 P22

- 7 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]



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(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.

Field:	Description	Material	Colour	Price in \$	Brochure Number
Table:	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT
Sort:				Descending	
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		= 'Leather'	= 'Cream'		
or:					

Show the output from the query-by-example.

[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.

Field:					
Table:					
Sort:					
Show:	<input type="checkbox"/>				
Criteria:					
or:					

[5]



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- 5 A database, PLAYPRODUCTION, was set up to show the performance dates, prices and number of seats available at a theatre specialising in Shakespeare productions.

Play	Performance Date	Number Seats Stalls	Number Seats Circle	Price Stalls Seats \$	Price Circle Seats \$
As You Like It	01/07/2016	120	90	20.00	30.00
As You Like It	02/07/2016	85	45	30.00	40.00
As You Like It	09/07/2016	31	4	30.00	40.00
Macbeth	14/07/2016	101	56	25.00	35.00
Macbeth	15/07/2016	50	34	25.00	35.00
Macbeth	16/07/2016	12	5	35.00	50.00
Julius Caesar	22/07/2016	67	111	20.00	20.00
Julius Caesar	23/07/2016	21	24	15.00	15.00
A Comedy of Errors	30/07/2016	45	36	35.00	45.00

(a) Give the number of fields that are in each record. [1]

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

Play

Number Seats Stalls

Price Stalls Seats \$

[3]

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(c) The query-by-example grid below selects all the productions with more than 100 seats left in either the stalls or the circle.

Field:	Play	Performance Date	Number Seats Stalls	Number Seats Circle
Table:	PLAYPRODUCTION	PLAYPRODUCTION	PLAYPRODUCTION	PLAYPRODUCTION
Sort:	Ascending			
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:			> 100	
or:				> 100

Show what would be output from the query-by-example.

[3]

(d) Complete the query-by-example grid below to select all the productions with at least six seats left in the circle and show the Play, Performance Date and Price Circle Seats \$ in Performance Date order.

Field:	Play ✓	Performance Date	Number Seats Circle	Price
Table:	PP —	PP —	PP —	PP —
Sort:		Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Criteria:		7=6	
or:			

[5]



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#### Topic: 2.3 Databases

Q1/Nov 2016 P23

- 6 A database, THEATRETOURS, was set up to show the tour dates, towns, number of seats and prices in local currency for a Shakespeare play.

Town	Tour Date	Number of Seats	Price Local Currency
Wigan	18/08/2016	120	15.00
Dumfries	20/08/2016	160	12.50
Turin	25/08/2016	200	17.00
Macon	27/08/2016	75	18.00
Bordeaux	29/08/2016	170	20.00
Algiers	01/09/2016	125	1350.00
Windhoek	05/09/2016	65	90.00
Windhoek	06/09/2016	65	90.00
Port Elizabeth	10/09/2016	200	110.00

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

[2]

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

Give a reason for choosing this field.

[2]

(c) Use the query-by-example grid below to provide a list of tour dates and seat prices in alphabetical order of town.

Field:				
Table:				
Sort:				
Show:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

[4]



### Topic: 2.3 Databases

May/June 2017 P21

7. 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.

[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]

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(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.

Field:					
Table:					
Sort:					
Show:	<input type="checkbox"/>				
Criteria:					
or:					

May/June 2017.P22

Next class

- 5 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



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Data type

Data sample

[8]

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

(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.

Field:				
Table:				
Sort:				
Show:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

[3]

Name = "Zafar"  
Like

All Ahmed  
Zafar Ali  
Zafar Ali Khan

Oct/Nov 2017.P22

- 6 A database table, TRAIN, is to be set up for a railway company to keep a record of the engines available for use. Each engine has a unique number made up of 5 digits, nnnnn. The engines are classified as freight (F) or passenger (P) together with a power classification that is a whole number between 0 and 9, for example F8. The railway company keeps a record of the date of the last service for each engine.

(a) Identify the **three** 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



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Data sample

Field 3 Name

Data type

Data sample

[6]

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

[1]

(c) Using the query-by-example grid below, write a query to identify all passenger engines that have not been serviced in the past 12 months. Only display the engine numbers.

Field:				
Table:				
Sort:				
Show:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

[3]



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Computer Science 2210 Topical Past Papers Topic: 2.3 Databases cu.y•evU7PZJ Zak KHAN A Wildlife park has a database table, called LIVESTOCK, to Classify and record its animal species. Part Of the database table is shown, %-ecies Classificatim Mammal Mammal Mammal Mammal Herbivore Cyrvuvore Herbivore Herbivore Carnivore Chlivore (a) Suggest another appropriate field that could be added to this database by stating its name and data type. State its purpose and give an example Of the data it could contain. Field name Data Type pose Exa mple Of data 03-111-222-ZAK n o 121 Page 16 of 26 www.zakonweb.com

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases Zak KHAN (b) use the query-by-example god below to proude a list of all four legged matnmals that are herbivores, sorted alphabetically by species. with only the species displayed. A database table, PERFORMANCE, is used to keep a record of the performances at a local theatre. Show Number Type SN091 SN102 SN113 SN124 SN021 SN032 SN043 SN054 Drama Classical Classical Jazz Corneyd Corrwdy Title An Evening at Home Everülg Wzart Evening Bach Favourites 30 Years of Jazz Street 01 Sept 02 Oct 03 Nov 04 01 02 Mar 03 Am 04 May (a) State the number Of fields and records in the table. Fields 03-111-222-ZAK n o Sold out Yes No No Yes Yes Yes Page 1' of 26 www.zakonweb.com

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases (b) Give two validation checks that could be performed on the Show Number field. Vaidation Check 1 Vaidation Check 2 Zak KHAN 121 (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. A database table, TREES, is used to keep a record Of the trees in a park. Each tree is given a unique and is examined to see if it is at risk of dying. There are cwer 9m trees: part of the database table is shown, TN' 72  
TN824 TN532 TN3S4 n Oive Banyan Teak spruce C5 04 o 03-111-222-ZAK Page 18 of 26 www.zakonweb.com

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases (a) State the number of fields in the table. Zak KHAN (b) The tree numbering system uses TN followed by three digits. The numbering system Will not work if there are over trees. Describe, with the aid of an example, you could change the tree numbering system to alb\* for mer trees. Existing tree numbers must not be Charwed. (c) using the quervbv-esample grid, write a query to identify at risk trees over years old. Display only the type and the position on the map. 121 A database table, PORTRAIT, is used to keep a record Of the portraits available from a photographic Each portraithas a unique reference number PICnnn, where n isa single digit, for example PIC123, The Studio keeps a record Of the Size (for example 20 x 15), the type (black and White and the price in dollars. (a) Complete the table to show the most appropriate data type for each of the fields Data Reference Nurnber price in S n o 03-111-222-ZAK Page 19 of 26 www.zakonweb.com

 「工 IIVHV4VZ 罕 p Aq • 、 」 anb u' "Oua !! 5 ] — ] 】 Od □ - 0 u' — & •pue □ 0 ndwoo □ saseqQea EZ 益 0 S ] adedlsed — e — d01

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases (a) State whether any of the fields shown would be suitable as a primary key. Explain answer. Zak KHAN 121 (b) Complete the to show the most appropriate data type for each of the fields based on the data shown in the table at the start of question 6. Data Tree Type Size2 In (C) Show the output that would be given by this query-by-example\*, (31 TREETAB TREETAB TREETAB (d) Using the WIOwir\* query-example grid, write a query to identify all types Of the trees that are out of stock for all three sizes, Make sure the type of the tree and the various 'in stock' fields are shown, The trees Should be listed in alphabetical order by type. n o 03-111-222-ZAK Page 21 of 26 www.zakonweb.com

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases Zak KHAN The table, BEVERAGES, Shows the number Of calories in 100ml Of a range Of popular beverages. It also Shows the availability of these drinks in a can, a small bottle and a large bottle, Can Bev01 Bev05 Bev(X Bev07 Bev12 Bev' 5 Cola 2 LemuM Tea Apple Ju 40 47 38 Yes Yes (a) Give a reason for choosing gevNo as the primary key for this table. (b) State the number Of records shown in the table BEVERAGES (c) List the output that would be given by this Large BEVERAGES Table:  
03-111-222-ZAK BEVERAGES BEVERAGES BEVERAGES n o Page 22 of 26 [www.zakonweb.com](http://www.zakonweb.com)

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases Zak KHAN (d) Complete the query-by-example grid to output a list shmv•ng just the names and primarykeys of all the beverages with a calorie count greater than 45. The list should be in alphabetical order of names. A database table, FLIGHT, is used to keep a record of flights a small airfield. planes can passengers, freight or both. Some flights are marked as private and only carry passengers. FNIOI CNIOI CN102 FM 04 FN105 CN108 CM 10 Caravan I Caravan 2 Piper I Piper 2 Piper I Caravan I Caravan 2 Private passenger tbght Freight only only OrMy Freight and only Fre•t only Private passenger fbgnt 0800 1000 1030 00 (a) State the field that could have a Boolean data type. Field . 03-111-222-ZAK n o Page 23 of 26 [www.zakonweb.com](http://www.zakonweb.com)

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases Zak KHAN (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. FLGHT Explain why the query-by-example is incorrect, and write a correct query-by-example. Expla ti on 03-111-222-ZAK n o Page 24 of 26 www.zakonweb.com

 Computer Science 2210 Topical Past Papers Topic: 2.3 Databases Zak KHAN A database table, SALES. is used to keep a record Of items made and sold by a furniture maker. CHtK31 &nith — six \*nith — Hue — extra Patel - reøxert»nt Pate — PaW — (a) Explain why the field Item could not be used as a primary key. (b) A query-by-example has been written to display only the order number and item numbers of any items in progress or not Started. Like Explain why the is incorrect, and write a correct query-by-example. n o 03-111-222-ZAK Page of 26  
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database table as her mark book for her Computer Science Class, Which She has called MARKBOOK, For each student, the following data will be recorded: first name, last name, their year 10 test score and their year II test score. The class has 32 students. (a) State the number Of fields and records required for this database. Number of Fields Number of Records „ (b) The data in MARKBOOK is Stored under Category headings: LastName, FirstName, YIOTestScore and Y II TestScore. State, with a reason, whether any of these headings would be suitable as a primary key. (C) Complete the grid to Only the first name, last name and year 10 test Score Of each student who achieved 50 or more in their year 10 test. The output should be in test score order with the highest marks at the top of the list. (21 121 n o 03-111-222-ZAK Page 26 of 26 www.zakonweb.com