

Answers to Student's Book

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9 Databases

Answers to activities

Answers to question 3 in this section are example answers for past paper questions. The details of the relevant past paper can be found with the corresponding exam-style question in the Student's Book.

9.1

Sample fields for database APPOINTMENT:

- Number of patients: e.g. PatientNumber
- Name of patient: e.g. PatientName
- Time of appointment: e.g. AppointmentTime
- Length of appointment: e.g. Duration

9.2

PATIENT					
Field Name	Data Type				
FirstName	Short Text				
FamilyName	Short Text				
DateOfAdmission	Date/Time				
Consultant	Short Text				
WardNumber	Number				
BedNumber	Number				

PATIENT					
FirstName	FamilyName	DateOfAdmission	Consultant	WardNumber	BedNumber
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	01/11/2022	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

Field Size	Integer
Format	
Decimal Places	0
Input Mask	
Caption	
Default Value	
Validation Rule	>0<=10
Validation Text	Ward number must be between 1 and 10 inclusive

Field Size	Integer
Format	
Decimal Places	0
Input Mask	
Caption	
Default Value	
Validation Rule	>0<=8
Validation Text	Bed number must be between 1 and 8 inclusive

9.3

PATIENT							
HospitalNumber	FirstName	FamilyName	DateOfAdmission	Consultant	WardNumber	BedNumber	
HN000001	Winnie	Sing	12/10/2022	Mr Smith	6	8	
HN000002	Steve	Chow	23/10/2022	Miss Abebe	6	3	
HN000003	Chin	Wee	30/10/2022	Mr Jones	7	1	
HN000004	Min	Hoo	01/11/2022	Mr Smith	6	1	
HN000005	Peter	Patel	12/11/2022	Mr Jones	7	8	
HN000006	Sue	Sands	19/11/2022	Miss Abebe	6	2	
HN000007	Farouk	Khan	22/11/2022	Mr Jones	7	4	
HN000008	Ahmad	Teo	22/11/2022	Mr Jones	7	2	

9.4

1 Four from:

- Text – a number of characters, for example a person's name
- Char – a single character, for example M or F for male or female
- Boolean – True or False, for example whether an item has been sold or not
- Integer – a whole number, for example the number of items in stock
- Real – a decimal number, for example the price of an item
- Date/time – for example the date and time of an appointment

2 A single table database contains one table. Each table consists of many records. Every record has the same number of fields. Every field is given a data type. Examples of data types are char, Boolean and text. Some fields will have validation rules.

9.5

- 1
 - a `SELECT FirstName, FamilyName
FROM PATIENT
WHERE Consultant = 'Mr Jones';`
 - b `SELECT FirstName, FamilyName
FROM PATIENT
WHERE WardNumber <> 6;`
 - c `SELECT FirstName, FamilyName
FROM PATIENT
WHERE DateOfAdmission = '12/11/2022';`
 - d `SELECT FirstName, FamilyName, DateOfAdmission
FROM PATIENT
WHERE DateOfAdmission >= '12/10/2022' AND <= '30/10/2022';`

FirstName	FamilyName	BedNumber
Chin	Wee	1
Peter	Patel	8
Ahmad	Teo	2
Farouk	Khan	4

9.6

- 1 a `SELECT Count (WardNumber)`
`FROM PATIENT`
`WHERE WardNumber = 7;`
- b `SELECT Count (WardNumber)`
`FROM PATIENT`
`WHERE WardNumber <> 7;`

2

CubNumber	CubName	DateOfBirth	Address	Gender	School	TelephoneNt	DateJoined
C010	Suzy	12/01/2015	The House	F	WestCliffe	0779988	12/01/2022
C011	Joe	12/01/2015	The House	M	EastCliffe	0779988	12/01/2022
C001	Ali	03/11/2012	The Green	M	EastCliffe	0773366	01/01/2020
C002	Max	07/07/2012	West Green	M	EastCliffe	0774421	01/01/2020
C004	Nina	01/03/2013	East Green	F	WestCliffe	0773145	08/01/2021
C005	Maurice	27/11/2013	North Port	M	EastCliffe	0778356	08/01/2021
C006	Wendy	03/04/2014	The Field	F	WestCliffe	0779800	04/06/2021
C007	Ian	11/12/2014	Forest View	M	EastCliffe	0776535	12/01/2022
C008	Cy	09/09/2014	Garden View	M	NorthCliffe	0789355	12/01/2022
C012	Jay	30/10/2014	Sea View	M	NorthCliffe	0782121	12/01/2022

9.7

1 a

CubNumber	CubName	DateOfBirth	Address	Gender	School	TelephoneNt	DateJoined
C010	Suzy	12/01/2015	The House	F	WestCliffe	0779988	12/01/2022
C011	Joe	12/01/2015	The House	M	EastCliffe	0779988	12/01/2022
C001	Ali	03/11/2012	The Green	M	EastCliffe	0773366	01/01/2020
C002	Max	07/07/2012	West Green	M	EastCliffe	0774421	01/01/2020
C004	Nina	01/03/2013	East Green	F	WestCliffe	0773145	08/01/2021
C005	Maurice	27/11/2013	North Port	M	EastCliffe	0778356	08/01/2021
C006	Wendy	03/04/2014	The Field	F	WestCliffe	0779800	04/06/2021
C007	Ian	11/12/2014	Forest View	M	EastCliffe	0776535	12/01/2022
C008	Cy	09/09/2014	Garden View	M	NorthCliffe	0789355	12/01/2022
C012	Jay	30/10/2014	Sea View	M	NorthCliffe	0782121	12/01/2022

b

CubNumber	CubName	DateOfBirth	Address	Gender	School	TelephoneNt	DateJoined	Six
C010	Suzy	12/01/2015	The House	F	WestCliffe	0779988	12/01/2022	red
C011	Joe	12/01/2015	The House	M	EastCliffe	0779988	12/01/2022	blue
C001	Ali	03/11/2012	The Green	M	EastCliffe	0773366	01/01/2020	red
C002	Max	07/07/2012	West Green	M	EastCliffe	0774421	01/01/2020	red
C004	Nina	01/03/2013	East Green	F	WestCliffe	0773145	08/01/2021	red
C005	Maurice	27/11/2013	North Port	M	EastCliffe	0778356	08/01/2021	blue
C006	Wendy	03/04/2014	The Field	F	WestCliffe	0779800	04/06/2021	red
C007	Ian	11/12/2014	Forest View	M	EastCliffe	0776535	12/01/2022	green
C008	Cy	09/09/2014	Garden View	M	NorthCliffe	0789355	12/01/2022	green
C012	Jay	30/10/2014	Sea View	M	NorthCliffe	0782121	12/01/2022	red

- i `SELECT CubName`
`FROM CUB`
`WHERE Six = 'red';`
- ii `SELECT CubName`
`FROM CUB`
`WHERE Six = 'red' OR Six = 'blue';`
- iii `SELECT COUNT(Six)`
`FROM CUB`
`WHERE Six = 'red';`
- c `SELECT Sum (Badges)`
`FROM CUB;`

9.8

- 1 a
- Family name – text
 - Other names – text
 - Student ID – text
 - Date of Birth – date
 - Date of Entry to School – date
 - Current Class – date
 - Current school year/grade – integer
 - Email address – text
- b
- Family name – verification
 - Other names – verification
 - Student ID – verification and validation
 - Date of Birth – verification and validation
 - Date of Entry to School – verification and validation
 - Current Class – verification and validation
 - Current school year/grade – verification and validation
 - Email address – verification and validation
- c
- Student ID – presence check, length check and format check
 - Date of Birth – range check and format check
 - Date of Entry to School – range check and format check
 - Current Class – format check
 - Current school year/grade – format check
 - Email address – format check
- d Student ID
- e Example: five characters, S followed by four digits

Field Name	Data Type
StudentID	Short Text
FamilyName	Short Text
OtherNames	Short Text
DateOfBirth	Date/Time
DateEntrySchool	Date/Time
CurrentClass	Short Text
CurrentSchoolYear	Number
EmailAddress	Short Text

- g i** `SELECT OtherNames, FamilyName, EmailAddress`
`FROM STUDENT`
`ORDER By FamilyName;`
- ii** `SELECT OtherNames, FamilyName`
`FROM STUDENT`
`ORDER BY CurrentClass, FamilyName;`
- iii** e.g. for year 3 it would be:
`SELECT OtherNames, FamilyName, DateOfBirth`
`FROM STUDENT`
`WHERE CurrentSchoolYear = 3`
`ORDER BY CurrentClass;`
 Similar SQL queries would be used for each different school year group.

Answers to exam-style questions

- 1 a i** 10 records
- ii** 11 fields
- iii** No field is suitable to use as a primary key as none of the field values are unique.
- b** CR
 LR
- c** `SELECT *`
`FROM CAR`
`WHERE leather AND (silver OR grey);`
- 2 a i**
- model number – text – used when the field contains numbers and characters
 - description – text – suitable for characters
 - colour – text – suitable for characters
 - size of wheels – integer – wheels are measured in mm in the example so no decimal places needed, hence integer is best option
 - price of model – real – price will often finish with \$XX.99, hence real numbers with decimal required
 - still manufactured – Boolean – can only be yes or no, hence Boolean is best option
 - number in stock – integer – can only be whole numbers of stock, hence integer is used
- ii**
- model number – presence check, format check and length check as the field must contain data; the first two characters should be letters and the last five numbers, and the number of characters should be seven
 - price – range check as the value should not be below a minimum number
 - number in stock – range check as this should not fall below zero
- iii** Model number is suitable to use as a primary key as this uniquely identifies the type of bicycle.

- b** For instance, to display the stock of each model number where there are less than 20 bikes left in stock, ordered by number in stock, we would use:

```
SELECT ModelNumber, NumberInStock  
FROM CYCLE  
WHERE NumberInStock < 20  
ORDER BY NumberInStock;
```

To calculate the total number of bikes in stock we would use:

```
SELECT SUM NumberInStock  
FROM CYCLE;
```

SELECT is used to specify the fields that will be displayed.

FROM defines which table the fields are taken from.

WHERE is an optional command that can add certain conditions on the records to be displayed.

SUM is an optional command used with SELECT to specify fields whose values will be added together.

ORDER BY is an optional command that defines the order in which records will be displayed.

- 3 a**
- Fields: 5
 - Records: 8
- b**
- Validation check 1: format check
 - Validation check 2: presence check