

# M358

## Assignment Booklet I

October 2003 Presentation

**TMA 01**

**Cut-off date: 3 January 2004**

Please send all your answers to each tutor-marked assignment (TMA), together with an appropriately completed assignment form (TMA form), to reach your tutor on or before the appropriate cut-off date shown above.

If you wish your tutor to acknowledge receipt of your TMA, complete an assignment acknowledgement card, affix the appropriate postage and send it to your tutor together with your TMA.

You will find instructions on how to fill in the TMA form in the current Student Handbook. Remember to fill in the correct Assignment Number as listed above and allow sufficient time in the post for each assignment to reach its destination on or before the cut-off date.

The marks allocated to each part of each question are indicated in the margin.

*Please also note it is to your benefit to monitor the acknowledgement from your tutor on the receipt of your TMA within two weeks after submission; otherwise any claim for TMA Lost in Postage will not be accepted.*

## Question 1 (45 marks)

- (a) The following questions relate to your work with the Hospital example database and the *Dyna* Text system.
- (i) using the Hospital example database, state the steps required in using the Patient Criteria form to locate those patients who are in the Anglia ward with Dr Shine as their consultant. What additional information would you require to allow you to use the Consultant Patient form to locate the same information? [7]
  - (ii) The Patient Table form gives information about patients who are in the hospital. Explain why this form is not adequate, in general, for identifying the doctor who is responsible for a particular patient. What additional information should be shown to meet this requirement and why would the information you identify improve the form? [6]
  - (iii) The *Dyna* Text system allows the searching of general text data. The hospital forms, such as Patient Like, allows the searching of structured data. Give one advantage that searching structured data has over searching general text. Support your answer by considering how to locate information about patients called Jones. [2]
- (b) The following questions relate to your work with the University example database using the Central Menu of the University Application.
- (i) Give one or more sentences, in the style of Solution 3.7, to interpret the data displayed under the Assignments option for the student with student identifier s07. [5]
  - (ii) Describe two different implicit rules for interpreting the data for the Assignments option when no value is displayed in some rows in certain columns. Use the data shown for the students with student identifiers s05 and s46 to support your answer. [6]
  - (iii) On some of the forms a tutor's name is labelled as Name, on others as Tutor Name. Explain why the shorter label, Name, is acceptable on some forms but not on others. [4]
- (c) The following questions relate to your work using InfoMaker with the Bird example database.
- (i) Using the Observations form you can use the Criteria button to select, for example, information recorded about observations of mallards or any other bird whose common name you know. Describe how you could modify the form so that, when run, the modified form would show only the recorded observations for mallards (that is, without the user needing to use the Criteria button). [5]
  - (ii) When creating a form to display data from tables, InfoMaker allows you to choose between Grid and Freeform styles for the appearance of the form. When using either of these styles to display a table give two additional choices you can make when selecting the data to display and briefly describe how InfoMaker allows you to make these choices without the need to use SQL. [6]
  - (iii) Explain the terms 'user view' and 'database view' of the data in a table. You can use your answer to part (c)(ii) to support your explanation. [4]

**Question 2 (15 marks)**

- (i) A database may be changed in two ways. The first way is generally known as updating and involves adding new data, modifying existing data or deleting existing data; for example, adding data for a new student. The second way involves changes to the definition of data; for example, removing a column in a table. For each kind of change, list three possible problems that may occur. [6]
- (ii) Explain why using an application process to access data in a database does not require understanding of how the data is organized in the database, but using a database tool does require some understanding of data organization. [4]
- (iii) Describe the problem that may occur when an application process accessing a large table does not allow users to specify precisely the rows to be retrieved. [5]

**Question 3 (40 marks)**

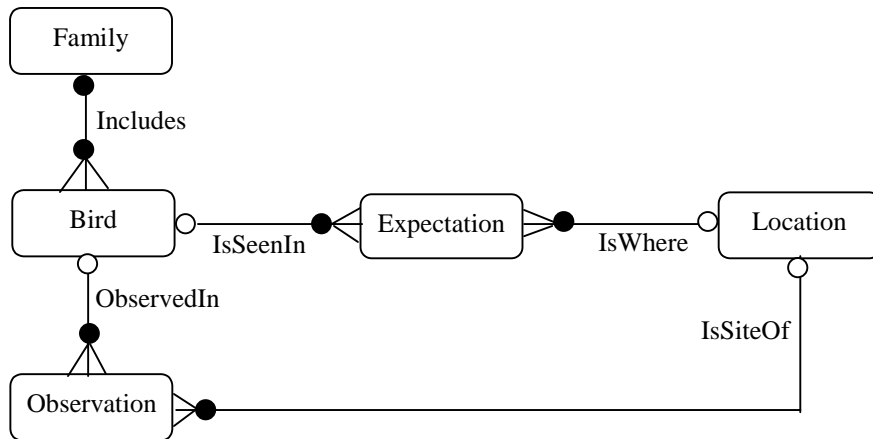
- (a) Figure 1 is a conceptual data model for the Bird example, according to the specification of data requirements given in the course text, as follows.

Members of a bird-watching club have agreed that they each would like to have their own personal information system which records details of the birds they are interested in. The details may relate to any birds, but in particular it involves those they have observed and those they are planning to look for. Members also think that they are each likely to want different ways in which they might examine this information, such as to find the birds observed on some particular date. They would also be interested in exchanging information among themselves, such as details of which birds might be seen at a specific location.

The data required for each bird includes its common name, its biological term, size, colouring, picture (if one is available) and a description of its usual habitat. Each bird also belongs to a family; data about a family includes a name and a description of the general characteristics.

For each recorded bird there may be a number of observations, each involving the date, location and notes about what was seen – members want to be able to keep a description of any aspect of an observation that is considered of interest.

To help in planning trips, members would like to record the locations and seasons at which they may expect to see certain birds of interest, together with a possible special behaviour.



**Entity types**

- Family (FamilyName, Characteristics)
- Bird (CommonName, BiologicalName, Size, Colouring, Picture, Habitat)
- Observation (BirdName, Date, Notes)
- Location (LocationName, Description)
- Expectation (BirdName, LocationName, Season, Behaviour)

**Constraints**

The values for Season are restricted to spring, summer, autumn and winter.

**Assumptions**

A family is only recorded when a bird of that family is recorded.

There is only one recorded observation of a bird on any day (though the notes for that day may record multiple sightings of that bird at one location).

Figure 1 The Bird conceptual data model

- (i) Explain why the second assumption in Figure 1 is required in this conceptual data model. How would the model change if it was required to allow the recording of more than one observation of a bird on a given day? [10]
- (ii) Describe two ways in which the model shows that a bird could be recorded as being expected to be seen at more than one location. [10]
- (iii) Explain the meaning of the participation conditions of the ObservedIn relationship, and the implications they have for possible occurrences of the entity types involved. [8]
- (iv) When a rare bird is observed the Royal Society for the Protection of Birds (RSPB) likes to be informed of the sighting. To validate such sightings the RSPB require the names, addresses and telephone numbers of at least two witnesses who can confirm the observation. The same witness may be a witness to more than one observation.

These details are to be included in the Birds database, and the first step is to represent this additional requirement as part of the conceptual data model. Give the changes to the E-R diagram and the entity types that are needed for this requirement, with an explanation of the reason for the degree and participation properties you choose for any relationship.

(You do not have to reproduce the entire model, just those parts which are changed or extended by your answer.) [12]

**End**