Melbourne Library

Design tools used to represent the appearance and function of a DBMS

Dexter is a member of the Melbourne Library.

Melbourne Library provides access to nearly one million items including books, magazines and newspapers.

Members of the library are allowed to borrow books for ten days before they are required to return the book.

Presently all of the data related to a member borrowing a book is recorded in a flat-file database.

**Sample data**

A sample of the data stored in the flat-file database is shown over the page.

**Relational database management system solution**

The staff at the Melbourne Library require a relational database management system designed and developed.

**Additional information**

* A member may borrow many books
* A book may be borrowed many times

**Sample Data**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Book Title** | **Book Category** | **Book Author** | **Member ID** | **Member First name** | **Member Last name** | **Member Mobile** | **Date**  **Borrowed** | **Date**  **Due** | **Returned** |
| The Lion King | Fiction | King | LC0001 | Leo | Chung | +61 0401234567 | 11/10/2017 | 21/10/2017 | Yes |
| Accounting Made Easy | Non-Fiction | Cooper | LC0001 | Leo | Chung | +61 0401234567 | 11/10/2017 | 21/10/2017 | No |
| Gaming The Day Away | Non-Fiction | English | LC0002 | Liam | Coustley | +61 0405678234 | 12/10/2017 | 22/10/2017 | Yes |
| What Law? | Fiction | King | LC0002 | Liam | Coustley | +61 0405678234 | 12/10/2017 | 22/10/2017 | No |
| Never Talking | Fiction | Ludlowe | NX0001 | Nancy | Xu | +61 0400567123 | 13/10/2017 | 23/10/2017 | Yes |
| Fashion 4 You | Non-Fiction | Little | NX0001 | Nancy | Xu | +61 0400567123 | 13/10/2017 | 23/10/2017 | No |
| Talking History | Non-Fiction | Townsend | JH0001 | Justin | Huels | +61 0403987321 | 14/10/2017 | 24/10/2017 | Yes |
| Legal for Experts | Non-Fiction | Bjork | JH0001 | Justin | Huels | +61 0403987321 | 14/10/2017 | 24/10/2017 | No |
| Macbeth | Fiction | Shakespeare | IL0001 | Ian | Li | +61 0403456890 | 15/10/2017 | 25/10/2017 | Yes |
| Twelve Angry Men | Fiction | Rose | IL0001 | Ian | Li | +61 0403456890 | 15/10/2017 | 25/10/2017 | No |
| The Lion King | Fiction | King | NX0001 | Nancy | Xu | +61 0400567123 | 16/10/2017 | 26/10/2017 | Yes |
| Gaming The Day Away | Non-Fiction | English | LC0001 | Leo | Chung | +61 0401234567 | 16/10/2017 | 26/10/2017 | No |

**Design**

**1. Create** an entity-relationship (ER) diagram of the proposed relational database. **Indicate** the type of relationships between entities.

**2. Create** a data dictionary for each table.

Indicate:

* the name of each table
* the name of each field
* the data type of each field
* the field size (if short text)
* any other properties including primary and foreign keys or any validation used

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| **Field** | **Data type** | **Field Size**  **(if short text)** | **Other properties** |
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| **Field** | **Data type** | **Field Size**  **(if short text)** | **Other properties** |
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| **Field** | **Data type** | **Field Size**  **(if short text)** | **Other properties** |
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**3. Create** a layout diagram showing how **only** the main transaction (borrowings) form will appear.

**4. Create** a design for each query required to retrieve the following information.

A. A list of all books sorted by BookTitle from A to Z.

B. A list of all the books where the category is fiction.

C. A list of all the books and member details where the book has not been returned.

D. A list of all details about books borrowed between 13/10/2017 and 16/10/2017.

E. The total number of books borrowed by Nancy Xu.

F. The total number of fiction and non-fiction books borrowed.