

MICROSOFT ACCESS: STUDENT-LOAN-BOOK DATABASE

Purpose

Create a Microsoft Access database with three tables:

1. STUDENT
2. LOAN
3. BOOK

Relationships:

STUDENT (1) -> (many) LOAN
BOOK (1) -> (many) LOAN

All primary keys must be Number, not Text and not AutoNumber.

1. CREATE A NEW DATABASE

1. Open Microsoft Access.
2. Select Blank database.
3. Enter the database name:
LibraryDatabase
4. Choose where to save the database.
5. Click Create.

2. CREATE THE STUDENT TABLE

1. Go to Create -> Table Design.
2. Enter the following fields:

Field Name	Data Type	Key
StudentID	Number	Primary Key
FirstName	Short Text	
LastName	Short Text	
Email	Short Text	

3. Select the StudentID row.
4. Click Primary Key.
5. Make sure StudentID is:
Data Type: Number
Field Size: Long Integer
6. Do NOT use AutoNumber.
7. Save the table as:
STUDENT

3. ENTER 5 STUDENT RECORDS

Switch to Datasheet View and enter:

StudentID	FirstName	LastName	Email
101	John	Smith	john.smith@email.com
102	Sarah	Jones	sarah.jones@email.com
103	David	Brown	david.brown@email.com

104	Maria	Wilson	maria.wilson@email.com
105	Ahmed	Ali	ahmed.ali@email.com

4. CREATE THE BOOK TABLE

1. Go to Create -> Table Design.
2. Enter:

Field Name	Data Type	Key
BookID	Number	Primary Key
Title	Short Text	
Author	Short Text	
Category	Short Text	

3. Select BookID.
4. Click Primary Key.
5. Make sure BookID is:
Data Type: Number
Field Size: Long Integer
6. Do NOT use AutoNumber.
7. Save the table as:
BOOK

5. ENTER 5 BOOK RECORDS

Switch to Datasheet View and enter:

BookID	Title	Author	Category
201	Introduction to Computing	Alan Smith	Computing
202	Database Systems	Jane Brown	Database
203	Web Development	David Jones	Web
204	Computer Networks	Sarah Wilson	Networking
205	Cybersecurity Basics	Ahmed Khan	Security

6. CREATE THE LOAN TABLE

1. Go to Create -> Table Design.
2. Enter:

Field Name	Data Type	Key
LoanID	Number	Primary Key
StudentID	Number	Foreign Key
BookID	Number	Foreign Key
BorrowDate	Date/Time	
DueDate	Date/Time	
ReturnDate	Date/Time	

3. Select LoanID.
4. Click Primary Key.
5. Make sure LoanID is:
Data Type: Number

Field Size: Long Integer
6. Do NOT use AutoNumber.
7. Save the table as:
LOAN

7. SET THE FOREIGN KEYS

For StudentID in the LOAN table:

- Data Type: Number
- Field Size: Long Integer

For BookID in the LOAN table:

- Data Type: Number
- Field Size: Long Integer

The following fields must have compatible data types:

STUDENT.StudentID = Number / Long Integer
LOAN.StudentID = Number / Long Integer

BOOK.BookID = Number / Long Integer
LOAN.BookID = Number / Long Integer

8. ENTER 5 LOAN RECORDS

Switch to Datasheet View and enter:

LoanID	StudentID	BookID	BorrowDate	DueDate	ReturnDate
1001	101	201	01/10/2026	15/10/2026	14/10/2026
1002	101	202	02/10/2026	16/10/2026	
1003	102	201	03/10/2026	17/10/2026	16/10/2026
1004	103	203	04/10/2026	18/10/2026	
1005	104	204	05/10/2026	19/10/2026	

A blank ReturnDate means that the book has not yet been returned.

9. CREATE THE STUDENT -> LOAN RELATIONSHIP

1. Go to:
Database Tools -> Relationships
2. If necessary, click Show Table.
3. Add:
STUDENT
LOAN
BOOK
4. Close the Show Table window.
5. Find StudentID in the STUDENT table.
6. Drag STUDENT.StudentID onto LOAN.StudentID.
7. The Edit Relationships window will appear.
8. Tick:
Enforce Referential Integrity

9. Click Create.

The relationship should show:

STUDENT 1 -> infinity LOAN

Meaning:

One student can have many loan records.

10. CREATE THE BOOK -> LOAN RELATIONSHIP

1. In the Relationships window, find BookID in the BOOK table.

2. Drag BOOK.BookID onto LOAN.BookID.

3. The Edit Relationships window will appear.

4. Tick:

Enforce Referential Integrity

5. Click Create.

The relationship should show:

BOOK 1 -> infinity LOAN

Meaning:

One book can have many loan records.

11. FINAL RELATIONSHIP STRUCTURE

STUDENT

StudentID PK

FirstName

LastName

Email

|
| 1
|
| infinity

LOAN

LoanID PK

StudentID FK

BookID FK

BorrowDate

DueDate

ReturnDate

|
| infinity
|
| 1

BOOK

BookID PK

Title
Author
Category

12. WHY IS LOAN A SEPARATE TABLE?

The LOAN table records the transaction between a student and a book.

For example:

StudentID = 101
BookID = 201
BorrowDate = 01/10/2026
DueDate = 15/10/2026

This means:

Student 101 borrowed Book 201 on 1 October 2026, and the book was due on 15 October 2026.

We do not directly connect STUDENT to BOOK. The LOAN table records the borrowing transactions.

13. IMPORTANT PRIMARY KEY AND FOREIGN KEY RULE

Primary keys:

- STUDENT.StudentID
- BOOK.BookID
- LOAN.LoanID

Foreign keys:

- LOAN.StudentID
- LOAN.BookID

For this exercise, all ID fields are Number with Field Size Long Integer.

Do not use:

- Short Text for ID fields
- AutoNumber for the primary keys

14. FINAL CHECKLIST

- [] STUDENT table created
- [] 5 student records entered
- [] StudentID is Number
- [] StudentID is NOT AutoNumber
- [] StudentID is Primary Key

- [] BOOK table created
- [] 5 book records entered
- [] BookID is Number
- [] BookID is NOT AutoNumber
- [] BookID is Primary Key

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[ ] LOAN table created
[ ] 5 loan records entered
[ ] LoanID is Number
[ ] LoanID is NOT AutoNumber
[ ] LoanID is Primary Key
[ ] LOAN.StudentID is Number / Long Integer
[ ] LOAN.BookID is Number / Long Integer

[ ] STUDENT.StudentID -> LOAN.StudentID relationship created
[ ] BOOK.BookID -> LOAN.BookID relationship created
[ ] Enforce Referential Integrity selected for both relationships
[ ] Relationships show 1 -> infinity
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