
Centre for Development of Advanced Computing (C-DAC) Bangalore

Post Graduate Diploma in Advanced Computing (PG-DAC)

August 2025 Batch

Lab Assessment

Module: Database Technologies

Date & Time: 29 Sep 2025, 1600 hrs - -1800 hrs

Duration: 2 hrs

MySQL Table Creation and Data

```
CREATE TABLE Books (  
    book_id INT PRIMARY KEY,  
    title VARCHAR(100),  
    author VARCHAR(50),  
    price DECIMAL(10,2),  
    published_year INT  
);
```

```
CREATE TABLE Borrowers (  
    borrower_id INT PRIMARY KEY,  
    name VARCHAR(50),  
    book_id INT,  
    borrow_date DATE,  
    return_date DATE,  
    FOREIGN KEY (book_id) REFERENCES Books(book_id)  
);
```

```
INSERT INTO Books VALUES  
(501, 'Data Science Essentials', 'Dr. Rao', 550.00, 2020),  
(502, 'AI Revolution', 'Mehta', 750.00, 2021),  
(503, 'Cloud Computing Basics', 'Anand', 450.00, 2019),  
(504, 'Database Systems', 'Sharma', 600.00, 2022),  
(505, 'Java Programming', 'Patel', 500.00, 2018),  
(506, 'Machine Learning Guide', 'Kapoor', 800.00, 2023);
```

INSERT INTO Borrowers VALUES

(601, 'Arun', 501, '2023-01-15', '2023-02-15'),
(602, 'Meena', 502, '2023-03-01', '2023-03-20'),
(603, 'Ravi', 503, '2023-02-10', '2023-02-28'),
(604, 'Divya', 504, '2023-04-05', '2023-04-25'),
(605, 'Kiran', 505, '2023-05-12', NULL),
(606, 'Sonia', 506, '2023-06-01', '2023-06-30');

SQL Problem Statements

- Q1. List all books published after 2020. -- 2 Marks
- Q2. Display all borrowers who borrowed books in March 2023. -- 2 Marks
- Q3. Show all books priced more than 600. -- 2 Marks
- Q4. Display all borrowers whose return_date is NULL (not yet returned). -- 2 Marks
- Q5. Find the average price of books by each author. -- 4 Marks
- Q6. Display the total number of books borrowed by each borrower. -- 4 Marks
- Q7. Show the most expensive book borrowed by each borrower. -- 4 Marks
- Q8. Write a stored procedure GetBorrowerCountByBook that takes a book ID as IN parameter and returns the number of borrowers for that book as OUT parameter. -- 5 Marks
- Q9. Write a function LateFee that takes number of delayed days as input and returns the fine amount (assume Rs.10 per day). -- 5 Marks

MongoDB Sample Data (**orders** collection)

MongoDB Sample Data (borrowers collection)

```
[  
  
  { "borrower_id": 601, "name": "Arun", "book": "Data Science Essentials", "borrow_date": "2023-01-15",  
    "return_date": "2023-02-15" },  
  
  { "borrower_id": 602, "name": "Meena", "book": "AI Revolution", "borrow_date": "2023-03-01",  
    "return_date": "2023-03-20" },  
  
  { "borrower_id": 603, "name": "Ravi", "book": "Cloud Computing Basics", "borrow_date": "2023-02-10",  
    "return_date": "2023-02-28" },  
  
  { "borrower_id": 604, "name": "Divya", "book": "Database Systems", "borrow_date": "2023-04-05",  
    "return_date": "2023-04-25" },  
  
  { "borrower_id": 605, "name": "Kiran", "book": "Java Programming", "borrow_date": "2023-05-12",  
    "return_date": null },  
  
  { "borrower_id": 606, "name": "Sonia", "book": "Machine Learning Guide", "borrow_date": "2023-06-01",  
    "return_date": "2023-06-30" }  
]
```

MongoDB Problem Statements

Q10. Display all borrow records of borrower "Arun". -- 2 Marks

Q11. Find all books borrowed after "2023-03-01". -- 2 Marks

Q12. Display all borrowers who borrowed either "AI Revolution" or "Database Systems". -- 2 Marks

Q13. Show only the borrower name and book title. -- 2 Marks

Q14. Use an aggregate function to count how many total books have been borrowed. -- 2 Marks