

## Practical Work 2 — SQL Query Language (SELECT)

### Context

We consider again the Library database introduced in Practical Work 1, already created and populated. The objective of this session is to progressively master the SQL SELECT statement, from basic retrieval to advanced querying techniques.

**Part 1 — Basic Queries : Single-table queries with simple predicates** Retrieve all available books.

1. Retrieve books published between 1980 and 2024.
2. List members whose first name starts with 'A'.
3. List books whose category is 'Computer Science' or 'Novel'.
4. Retrieve books whose title contains the keyword 'Networks'.
5. List members who registered after March 1, 2024.
6. Retrieve books published after 2000.
7. List authors of Algerian nationality.

**Part 2 — Intermediate Queries : Complex Selection Conditions and Join Operations**

8. List books that are not available and belong to the category 'Novel'.
9. Retrieve members registered in 2024 whose phone number starts with '05'.
10. List books whose title contains 'DB' and whose publication year is greater than 2000.
11. Retrieve books that are available and not in the category 'History'.
12. Retrieve each book's title, author, and publication year.
13. List the names of members who have performed at least one loan.
14. Retrieve books borrowed by the member 'Sherif Aicha'.
15. List all reservations with the member's full name.
16. Retrieve books along with their author and category.
17. List all loans with member name, book title, and loan date.

**Part 3 — Advanced Queries : Aggregate Functions, GROUP BY and HAVING, set operations, Subqueries**

18. Count the total number of books.
19. Count members who registered in 2024.
20. Find the earliest publication year.
21. Compute the average publication year of Computer Science books.
22. Compute the number of available books per category.
23. For each category, display the number of books, only if this number is greater than 1.
24. List authors who have written at least two books.
27. List members who have made more than one loan.
28. List titles of books that have been borrowed OR reserved. (*UNION*)
29. List books that have been both borrowed AND reserved. (*INTERSECT*)
30. List books that have been borrowed but NOT reserved. (*EXCEPT*)
30. Retrieve books whose author is over 80 years old (assumed in 2024).

31. Retrieve books written by Algerian authors.
32. List members who have performed at least one loan.
33. Retrieve books that have been reserved.
34. Retrieve books whose publication year is greater than any book written by Victor Hugo.
35. Retrieve loans that occurred before any reservation.
36. Retrieve books published after all books in the 'History' category.
37. Retrieve loans whose return date is later than all loan dates.
38. Retrieve books published before all books in the 'Computer Science' category.
39. Retrieve books published in the same year as any book in the 'Novel' category.
40. Retrieve books whose publication year is different from all books in the 'Poetry' category.

#### **Part 4 — Additional Advanced Queries**

41. Retrieve titles of books written by French authors.
42. Retrieve books that have never been borrowed.
43. List members who have never made a reservation.
44. Retrieve books borrowed only by members registered in 2024.
45. Retrieve books written by the same author as 'The Little Prince'.
46. Retrieve books older than all books in the 'Science' category.
47. Retrieve books borrowed by members who have also made reservations.
48. Retrieve books that have been reserved but never borrowed.
49. Display all books sorted by publication year in descending order.
50. List members sorted by last name in ascending order, then by first name in ascending order.
51. Display loans sorted by loan date from the most recent to the oldest.
52. List books sorted first by category, then by title.
53. List members who have made at least one loan using EXISTS.
54. List books that have never been borrowed using NOT EXISTS.
55. List members who have made at least one reservation using EXISTS.
56. List authors who have no books recorded in the library using NOT EXISTS.
57. List books that have been borrowed at least once using EXISTS.
58. List members who have never made any reservation using NOT EXISTS.
59. List books whose publication year is greater than the average publication year of books in the same category.
60. List members whose number of loans is greater than the average number of loans per member.
61. List authors who have written more books than the average number of books per author.
62. Display books that have been borrowed more times than any other book in the same category.
63. List members who made a loan after their own registration date.
64. List books whose publication year is the oldest within their category.
65. Display members who have made a reservation for a book they also borrowed later.
66. List books that are borrowed by members who have never reserved any book.
67. Display authors for whom all recorded books have been borrowed at least once.
68. List categories in which at least one book has never been borrowed.