

# Assignment 1 Database Group Assumptions

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## Assumptions for the surrogate key

### ❑ **RESERVATION** relation

The combination of borrower\_no, reservation\_datetime, bookcopy\_id, and branch\_code are designated as a surrogate key to ensure that a borrower cannot make the same reservation for the same book copy at the same branch at the same time twice. This ensures no duplicate reservations are allowed.

- **borrower\_no** (Foreign Key, Surrogate key):  
This represents the borrower's unique number. A borrower can reserve multiple books, but they cannot reserve the same book at the same branch at the same time more than once. Thus, borrower\_no is part of the surrogate key to prevent duplication of reservations by the same user for the same book.
- **reservation\_datetime** (Surrogate key):  
This field records the date and time when the reservation was made. Combined with borrower\_no, bookcopy\_id, and branch\_code, it forms a unique constraint. This ensures that no duplicate reservations are made for the same book at the same time by the same borrower at the same branch.
- **bookcopy\_id** (Foreign Key, Surrogate key):  
This is the unique identifier for the specific copy of the book being reserved. The surrogate key ensures that the same book copy cannot be reserved multiple times by the same borrower at the same branch at the same time.
- **branch\_code** (Foreign Key, Surrogate key):  
This represents the branch where the reservation is made. It ensures that no duplicate reservations are made for the same book copy at the same branch by the same borrower at the same time.

#### ❑ **LOAN** relation

The combination of `borrower_no`, `loan_datetime`, `bookcopy_id`, and `branch_code` is designated as a surrogate key to ensure that a borrower cannot borrow the same book at the same branch at the same time twice. This ensures no duplicate loans are allowed.

- `borrower_no` (Foreign Key, Surrogate key):  
This represents the borrower's unique number. A borrower can borrow multiple books, but they cannot borrow the same book at the same branch at the same time more than once.
- `loan_datetime` (Surrogate key):  
This field records the date and time when the loan was made. It is part of the surrogate key combination with `borrower_no`, `bookcopy_id`, and `branch_code` to ensure that no duplicate loans occur for the same book at the same time by the same borrower.
- `bookcopy_id` (Foreign Key, Surrogate key):  
This is the unique identifier for the specific copy of the book being borrowed. The surrogate key ensures that the same book copy cannot be borrowed multiple times by the same borrower at the same branch at the same time.
- `branch_code` (Foreign Key, Surrogate key):  
This represents the branch where the loan was made. It is part of the surrogate key to ensure that no duplicate loans occur for the same book copy at the same branch by the same borrower at the same time.

#### ❑ **FINE** relation

- `loan_id` (Foreign Key, Surrogate key):  
This represents the loan associated with the fine. Each fine is related to a specific loan, and this linkage is essential for tracking fines for overdue or damaged items. `loan_id` is part of the surrogate key because a borrower should not be fined multiple times for the same loan.