Name: Ngoc Phuong Trang Duọng
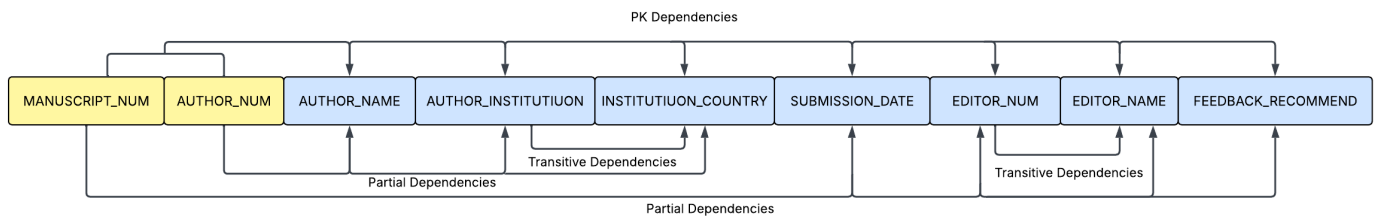
ID: 223990468

Task 4.1P

1. The Primary Key

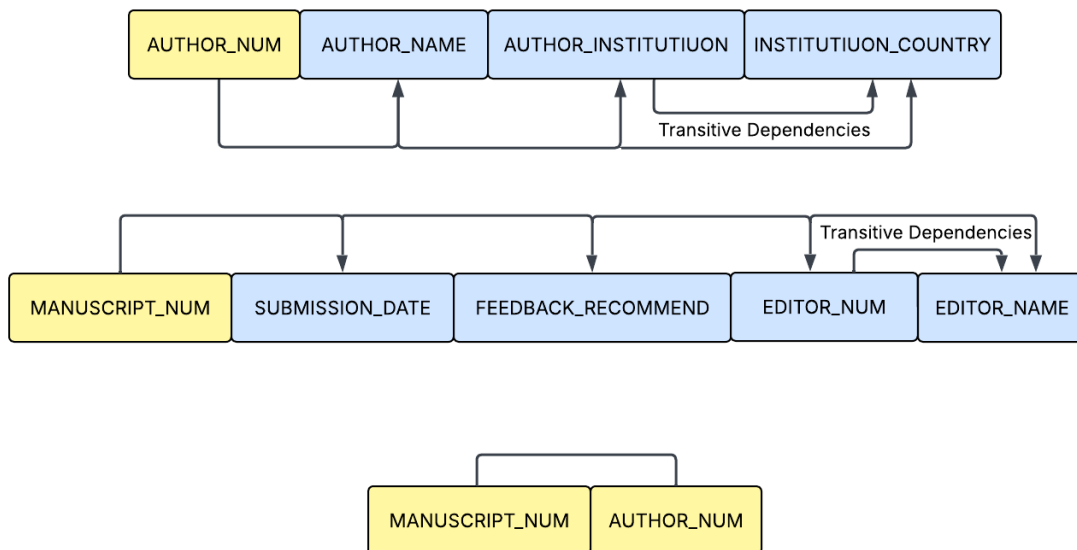Each unique record is identified by the combination of **MANUSCRIPT_NUM + AUTHOR_NUM**, because:

- A manuscript can have multiple authors (MANUSCRIPT_NUM repeats)
- An author can write multiple manuscripts (AUTHOR_NUM repeats)

Therefore, the **composite primary key** is: (MANUSCRIPT_NUM, AUTHOR_NUM)

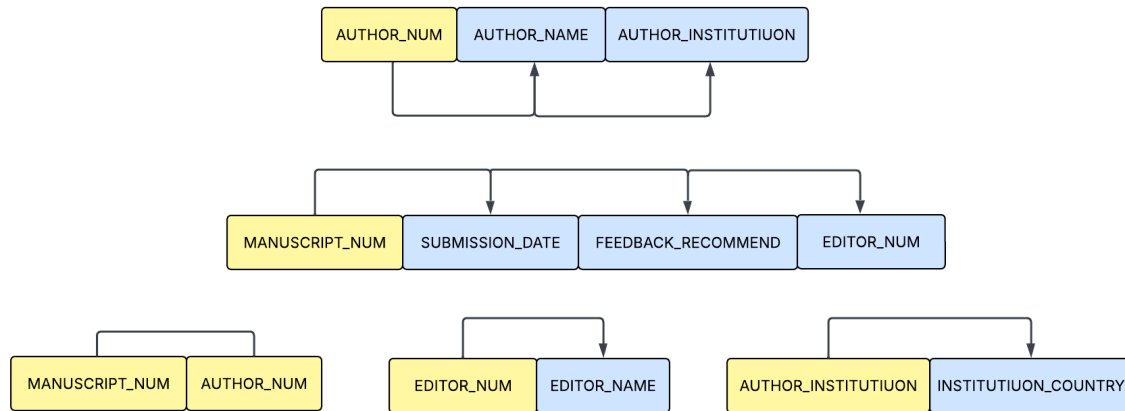### Dependency diagram:

2. 2NF

3. 3NF

4. Justify

After the normalisation process, the resulting tables were reviewed to ensure they meet the conditions for First, Second, and Third Normal Forms:

AUTHOR Table:

- **1NF**: Satisfied as all attributes contain atomic values (no repeating groups).
- **2NF**: Satisfied as all non-key attributes (AUTHOR_NAME, AUTHOR_INSTITUTION) fully depend on the primary key **AUTHOR_NUM**.
- **3NF**: Satisfied as there are no transitive dependencies. All non-key attributes depend only on the primary key.

EDITOR Table:

- **1NF**: Satisfied as all attributes contain atomic values (no repeating groups).
- **2NF**: Satisfied as the only non-key attribute **EDITOR_NAME** fully depends on the primary key **EDITOR_NUM**.
- **3NF**: Satisfied as there are no transitive dependencies.

MANUSCRIPT Table:

- **1NF**: Satisfied as all attributes contain atomic values (no repeating groups).
- **2NF**: Satisfied as all non-key attributes depend on the composite primary key **MANUSCRIPT_NUM** and **AUTHOR_NUM**.
- **3NF**: Satisfied after removing transitive dependencies (e.g., **EDITOR_NAME** was moved to the **EDITOR** table).

INSTITUTION Table:

- **1NF**: This table satisfies 1NF as it contains atomic attributes with no repeating groups.
- **2NF**: This table satisfies 2NF because all non-key attributes (INSTITUTION_COUNTRY) fully depend on the primary key (**AUTHOR_INSTITUION**).
- **3NF**: This table satisfies 3NF as there are no transitive dependencies. The **INSTITUTION_COUNTRY** attribute does not depend on any other non-key attribute.

MANUSCRIPT_AUTHOR Table:

- **1NF**: Satisfied as all attributes contain atomic values (no repeating groups).
- **2NF**: Satisfied as all attributes depend on the composite key **MANUSCRIPT_NUM** and **AUTHOR_NUM**.
- **3NF**: Satisfied as there are no transitive dependencies.

5. ERD