

# DATA 604 Assignment 2

## Constraints and Normal Form

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*Create a document describing at least 2 constraints per table. Give an example of a task that would violate each constraint.*

### Package

- Combination of Name and Version must be unique as it is the Primary Key (key constraint)
  - Example: Two tables with the same Name and Version
- Name cannot be a NULL value (entity integrity)
  - Example: Table with missing Name
- Max Python Version must be greater than or equal to Min Python Version (enterprise constraint)
  - Example: Max Python Version of 3.1 and Min Python Version of 3.2

### Author

- Username must be unique as it is the Primary Key (key constraint)
  - Example: Two tables with the same Username
- Username cannot be a NULL value (entity integrity)
  - Example: Table with missing Username
- Attributes must be character strings (domain integrity)
  - Example: Email is a numeric value

### License

- ID must be unique as it is the Primary Key (key constraint)
  - Example: Two tables with the same ID
- Name cannot be a NULL value (entity integrity)
  - Example: Table with missing ID
- The license text attribute must be a character string (domain integrity)
  - Example: License text is a numeric value

### Package Authors

- Name (foreign key) must have a matching primary key in the Package table (referential integrity)
  - Example: Package Authors Table with Name = Pandas when a Package Table with Name = Pandas does not exist
- Username (foreign key) must have a matching primary key in the Author table (referential integrity)
  - Example: Package Authors Table with Username = michael.ellsworth when an Authors Table with Username = michael.ellsworth does not exist

### License Authors

- Username (foreign key) must have a matching primary key in the Author table (referential integrity)

- Example: License Authors Table with Username = michael.ellsworth when an Authors Table with Username = michael.ellsworth does not exist
- ID (foreign key) must have a matching primary key in the License table (referential integrity)
  - Example: License Authors Table with ID = 19191 when a License Table with ID = 19191 does not exist

## Dependents

- Name (foreign key) must have a matching primary key in the Package table (referential integrity)
  - Example: Dependents Table with Name = Pandas when a Package Table with Name = Pandas does not exist
- The Name attribute must be a character string (domain integrity)
  - Example: Name is a numeric value

*Identify which normal form each table is in. Justify your answer. If a table is not in 1NF or 2NF, what could be done to make the table at least 2NF?*

## Package

The Package table is in the first normal form. There are no repeating groups in this table meaning all attributes have one value and only one value. This table is not in the second normal form because the “version” attribute is not dependent on the primary key. This attribute could be a variety of values but is dependent on creation date rather than the name of the package.

## Author

The Author table is in the third normal form. There are no repeating groups in this table, all attributes are dependent on the primary key, and all non-key attributes are not functionally dependent on another non-key attribute.

## License

The License table is in the third normal form. There are no repeating groups in this table, all attributes are dependent on the primary key, and all non-key attributes are not functionally dependent on another non-key attribute.

## Package Authors

The Package Authors table is in the third normal form. There are no repeating groups in this table, all attributes are dependent on the primary key, and all non-key attributes are not functionally dependent on another non-key attribute.

## License Authors

The License Authors table is in the third normal form. There are no repeating groups in this table, all attributes are dependent on the primary key, and all non-key attributes are not functionally dependent on another non-key attribute.

## Dependents

The Dependents table is in the third normal form. There are no repeating groups in this table, all attributes are dependent on the primary key, and all non-key attributes are not functionally dependent on another non-key attribute.