# **Normalisation Form**

These figures below are cited from Kaggle and generated/download as CSV files:

A screenshot of a computer

AI-generated content may be incorrect.Figure 1: Singapore MRT & LRT Stations Details (Updated in January 2025)

A screenshot of a computer

AI-generated content may be incorrect.

Figure 2: Singapore MRT & LRT Passenger Volume in October 2023

# **Normalisation Process**

**FORM: Figure 1**

## **UNF**

TRAIN (train\_code, train\_name, train\_line\_name, train\_start\_operation, train\_station\_address, train\_station\_lat, train\_station\_long, ura\_area, ura\_region)

## **1NF**

TRAIN (**train\_code**, train\_name, train\_line\_name, train\_start\_operation, train\_station\_address, train\_station\_lat, train\_station\_long, ura\_area, ura\_region)

CKs:

* **train\_code**
* train\_ name, train\_line\_name
* train\_station\_address, train\_line\_name

Partial Dependencies:

train\_station\_address 🡪 train\_station\_lat, train\_station\_long, ura\_area, ura\_region

## **2NF**

TRAIN (**train\_code**, train\_ name, train\_line\_name, train\_start\_operation, train\_station\_address)

TRAIN\_STATION (**train\_station\_address,**  train\_station\_lat, train\_station\_long, ura\_area, ura\_region)

Transitive Dependencies:

ura\_area 🡪 ura\_region

## **3NF**

TRAIN (**train\_code**, train\_ name, train\_line\_name, train\_start\_operation, train\_station\_address)

TRAIN\_STATION (**train\_station\_address,**  train\_station\_lat, train\_station\_long, ura\_area)

URA (**ura\_area**, ura\_region)

Full Dependencies:

train\_code 🡪 train\_ name, train\_line\_name, train\_start\_operation, train\_station\_address

train\_station\_address 🡪 train\_station\_lat, train\_station\_long, ura\_area

ura\_area 🡪 ura\_region

**FORM: Figure 2**

## **UNF**

TRAIN\_VOLUME ( train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code, train\_tap\_in, train\_tap\_out)

## **1NF**

TRAIN\_VOLUME **( train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code**, train\_tap\_in, train\_tap\_out)

CK:

train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code

*Note: year and month must be included as if the data stored continuously, will include different year and month. Unless the database store it differently every month*

Partial Dependencies:

None

## **2NF**

TRAIN\_VOLUME **( train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code**, train\_tap\_in, train\_tap\_out)

Transitive Dependencies:

None

## **3NF**

TRAIN\_VOLUME **( train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code**, train\_tap\_in, train\_tap\_out)

Full Dependencies:

train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code 🡪 train\_tap\_in, train\_tap\_out

# **FINAL 3NF Relations:**

TRAIN (**train\_code**, train\_ name, train\_line\_name, train\_start\_operation, train\_station\_address)

TRAIN\_STATION (**train\_station\_address,**  train\_station\_lat, train\_station\_long, ura\_area)

URA (**ura\_area**, ura\_region)

TRAIN\_VOLUME **( train\_volume\_year, train\_volume\_month, train\_volume\_day, train\_volume\_hour, train\_code**, train\_tap\_in, train\_tap\_out)