

**BUS USER SUPPORT SYSTEM**

**DETAIL DESIGN DOCUMENT**

**Data Design**

**Project Code: BUSS**

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# Introduction

## Purpose

Bus User Support System data design document describes structure of database and file structure of system including internal file structure as well as interface file structure.

## Definitions, Acronyms and Abbreviations

|  |  |  |
| --- | --- | --- |
| Abbreviations | Description | Comment |
| PK | Primary key | Use to indicate that a field is a primary key in table |
| FK | Foreign key | Use to indicate that a field is a foreign key in table |
| PFK | Primary Foreign key | Use to indicate that a field is a foreign key which referred to a column of another table as well as (a part of) primary of this table |
| V | Check value null | Set value “null” for attribute in table |
| Y | Check value unique | Set value “unique” for attribute in table |
| AI | Auto increment | Attribute of column in table |
| UN | Unsigned | Attribute of numeric column in table |

## References

List the entire reference document such as: other document of the system, or the technical article.

|  |  |
| --- | --- |
| Document Number | Title |
| v1.1 | BUSS\_ Class\_Design\_v1.1\_EN |
| v1.1 | BUSS\_ Screen\_Design\_v1.1\_EN |

## Overview

General overview of the detail design such as what is the structure of the document:

* Introduction
* Database
* Appendix

# Database

## ERDs

Entity relationship diagrams

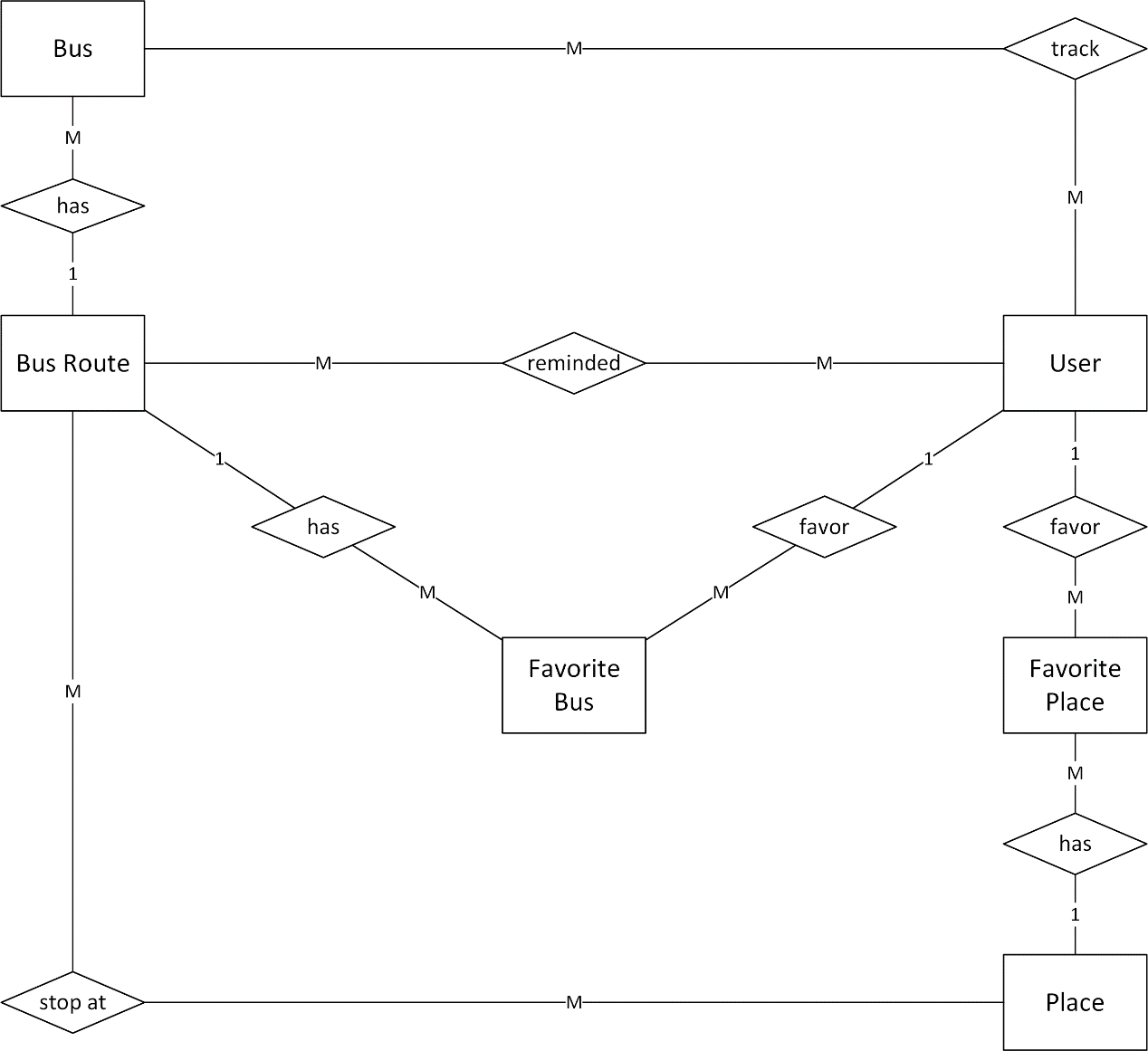


Figure 1.1: Entity relationship diagrams

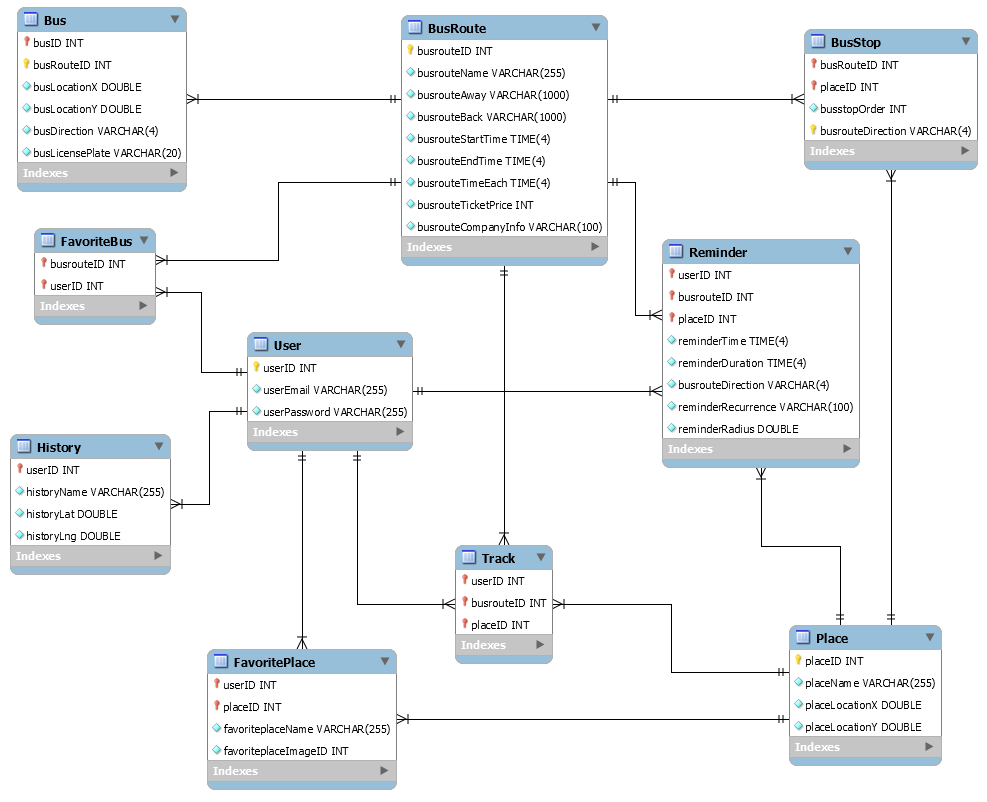
|  |  |  |
| --- | --- | --- |
| **No** | **Entity** | **Description** |
| 1 | User | User is all of the people using BUSS application. |
| 2 | Bus | The bus with its identify information |
| 3 | Favorite Bus | The favorite bus of user |
| 4 | Place | The place – the location |
| 5 | Favorite Place | The favorite place of user |
| 6 | Bus Route | The bus route |

List of relations of entities and brief description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Entity A** | **Entity B** | **Relation** | **Description** |
| 1 | User | Bus Route | Many to many | Each User can set remind for many Bus Routes and each Bus Route can be set remind for many Users |
| 2 | User | Bus | Many to many | Each User can track many Buses and each Bus can be tracked by many Users |
| 3 | User | Favorite Bus | One to many | Each User can has many Favorite Buses and each Favorite Bus is belong to one User |
| 4 | User | Favorite Place | One to many | Each User can has many Favorite Places and each Favorite Place is belong to one User |
| 5 | Bus Route | Bus | One to many | Each Bus Route can has many Bus and each Bus is belong to one Bus Route |
| 6 | Bus Route | Favorite Bus | One to many | Each Bus Route can be set as many Favorite Bus and each Favorite Bus is belong to one Bus Route |
| 7 | Bus Route | Place | Many to many | Each Bus Route have bus stop at many Place and each Place can be the bus stop for many Bus Route |
| 8 | Place | Favorite Place | One to many | Each Place can be set as many Favorite Place and each Favorite Place is one Place |

## Table Database

### Table diagram

Figure 1.2: Table diagram

n

List of tables and brief description

|  |  |  |
| --- | --- | --- |
| **No** | **Table Name** | **Description** |
|  | User | Store all user information |
|  | Place | Store all information of places |
|  | FavoritePlace | Store all information of favorite places |
|  | BusRoute | Store all information of bus routes |
|  | BusStop | Store all information of bus stops |
|  | Bus | Store all information of buses |
|  | FavoriteBus | Store all information of favorite buses |
|  | Track | Store all information of track |
|  | Reminder | Store all information of reminders |
|  | History | Store all information of find path history |

### User table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  | Y | PK | AI/UN | User’s id |
|  | userEmail | Varchar | 255 |  | Y |  |  | User login email |
|  | userPassword | Varchar | 255 |  |  |  |  | Store password login of user. |

### Place table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | placeID | Int |  |  | Y | PK | AI/ UN | Place’s id |
|  | placeName | Varchar | 255 |  |  |  |  | Place’s name |
|  | placeLocationX | Double |  |  |  |  | UN | Place’s latitude |
|  | placeLocationY | Double |  |  |  |  | UN | Place’s longitude |

### FavoritePlace table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  |  | PFK | UN | User’s id |
|  | placeID | Int |  |  |  | PFK | UN | Place’s id |
|  | favoritePlaceName | Varchar | 255 |  |  |  |  | Favorite place name |
|  | favoritePlaceImageID | Int |  |  |  |  | UN | Favorite place image ID |

### BusRoute table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | busrouteID | Int |  |  | Y | PK | UN | Bus route’s id |
|  | busrouteName | Varchar | 255 |  |  |  |  | Bus route’s name |
|  | busrouteAway | Varchar | 1000 |  |  |  |  | Bus route away |
|  | busrouteBack | Varchar | 1000 |  |  |  |  | Bus route back |
|  | busrouteStartTime | Time | 4 |  |  |  |  | Bus route start time |
|  | busrouteEndTime | Time | 4 |  |  |  |  | Bus route end time |
|  | busrouteTimeEach | Time | 4 |  |  |  |  | Bus route time each |
|  | busrouteTicketPrice | Int |  |  |  |  | UN | Bus route ticket price/ each |
|  | busrouteCompanyInfo | Varchar | 100 |  |  |  |  | Bus route company information |

### BusStop table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | placeID | Int |  |  |  | PFK | UN | Place’s id |
|  | busrouteID | Int |  |  |  | PFK | UN | Bus route’s id |
|  | busstopOrder | Int |  |  |  |  | UN | Bus stop order |
|  | busrouteDirection | Varchar | 50 |  |  | PK |  | Bus route direction |

### Bus table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | busID | Int |  |  |  | PK | UN | Bus’s id |
|  | busrouteID | Int |  |  |  | PFK | UN | Bus route’s id |
|  | busLocationX | Double |  |  |  |  | UN | Bus latitude |
|  | busLocationY | Double |  |  |  |  | UN | Bus longitude |
|  | busrouteDirection | Varchar | 4 |  |  |  |  | Bus route direction |

### FavoriteBus table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  |  | PFK | UN | User’s id |
|  | busRouteID | Int |  |  |  | PFK | UN | Bus route’s id |

### Track table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  |  | PFK | UN | User’s id |
|  | placeID | Int |  |  |  | PFK | UN | Place’s id |
|  | busID | Int |  |  |  | PFK | UN | Bus id |

### Reminder table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  |  | PFK | UN | User’s id |
|  | busrouteID | Int |  |  |  | PFK | UN | Bus route’s id |
|  | placeID | Int |  |  |  | PFK | UN | Place’s id |
|  | reminderTime | Time | 4 |  |  | PK |  | Reminder time |
|  | reminderDuration | Time | 4 |  |  |  |  | Reminder duration |
|  | busrouteDirection | Varchar | 4 |  |  |  |  | Bus route direction |
|  | reminderRecurrence | Varchar | 100 |  |  |  |  | Reminder recurrence |
|  | reminderRadius | Double |  |  |  |  |  | Reminder distance |

### History table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Field Name | Type | Length | Null | Unique | P/F Key | Default | Description |
|  | userID | Int |  |  |  | PFK | UN | User’s id |
|  | historyName | Varchar | 255 |  |  |  |  | History name |
|  | historyLat | Double |  |  |  |  | UN | History latitude |
|  | historyLng | Double |  |  |  |  | UN | History longitude |

# Appendix

## Data format symbol

Following symbols are used to describe format of data field in files as well as in tables.

|  |  |
| --- | --- |
| Symbol | Description |
| # | Digit placeholder. |
| . | Decimal placeholder. |
| , | Thousands separator. |
| : | Time separator. |
| / | Date separator. |
| \ | Treat the next character in the mask string as a literal. This allows you to include the '#', '&', 'A', and '?' characters in the mask. This character is treated as a literal for masking purposes. |
| > | Convert all the characters that follow to uppercase. |
| < | Convert all the characters that follow to lowercase. |
| A | Alphanumeric character placeholder (entry required). |
| A | Alphanumeric character placeholder (entry optional). |
| 9 | Digit placeholder (entry optional). For example: 0 – 9. |
| 0 | Digit placeholder (entry required). For example: 0 – 9. |
| C | Character or space placeholder (entry optional). Valid values for this placeholder are ANSI characters in the following ranges: 32-126 and 128-255. |
| & | Character placeholder (entry required). Valid values for this placeholder are ANSI characters in the following ranges: 32-126 and 128-255. |
| ? | Letter placeholder. For example: a – z or A – Z. |
| Literal | All other symbols are displayed as literals; that is, as themselves. bound in “” like “ABC” |