Business Template

SUBJECT AREAS

Logo / Image

CONTENTS

1 BUSINESS DESCRIPTION

1.1 BUSINESS BACKGROUND

Nowadays subways are widespread in different big cities for convenience of people living there. It is affordable and fast.

1.2 PROBLEMS. CURRENT SITUATION

Currently we have a subway network without a coordinated database.

1.3 THE BENEFITS OF IMPLEMENTING A DATABASE. PROJECT VISION

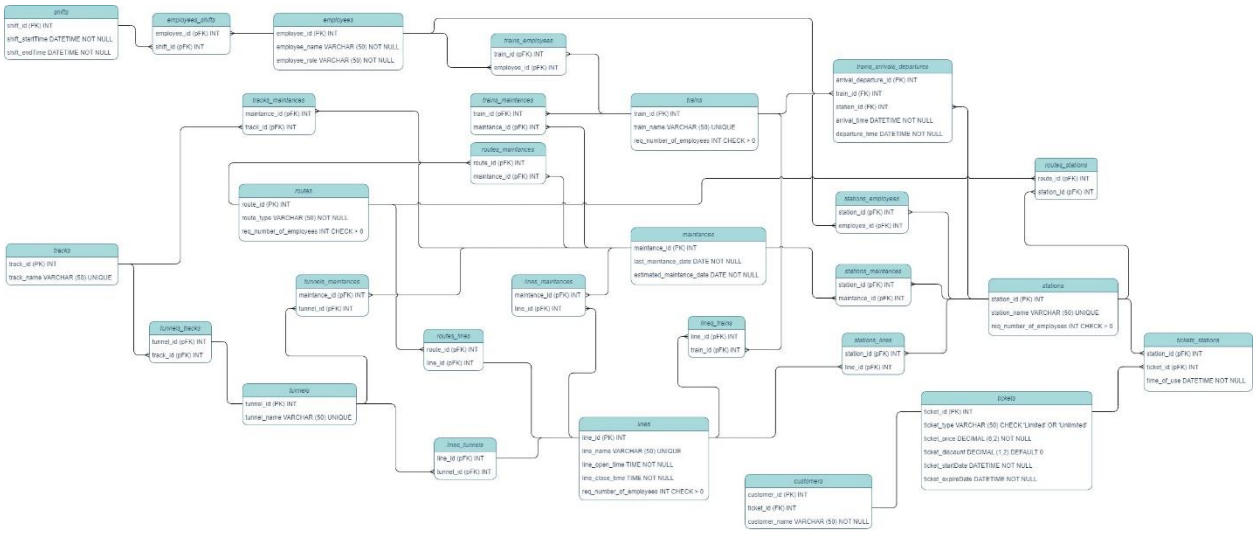
Benefits of implementing database structure to our subway system are fundamental. It will help store great amount of data and operate or analyze it with ease.

2 MODEL DESCRIPTION

2.1 DEFINITIONS & ACRONYMS

None

2.2 LOGICAL SCHEME



2.3 OBJECTS

Table Stations

This table contains basic required information about stations of our subway system.

Table Name	Field name	Field Description	Data Type
stations	station_id	Unique station Identifier, Primary Key, Autoincrement	Int
	station_name	Name of the station	VARCHAR (50)
	req_number_of_employees	Required number of employees to provide consistent work of the subway station	Int

Example with data:

station_id	station_name	req_number_of_employees
1	Gamardzhoba	14

Table Lines

This table contains basic required information about lines of our subway system.

Table Name	Field name	Field Description	Data Type
lines	line_id	Unique line Identifier, Primary Key, Autoincrement	Int
	line_name	Name of the line	VARCHAR (50)
	line_open_time	Time, when line starts working	TIME
	line_close_time	Time, when line stops working	TIME
	req_number_of_employees	Required number of employees to provide consistent work of the subway line	Int

Example with data:

line_id	line_name	line_open_time	line_close_time	req_number_of_employees
1	Green	06:00:00	23:30:00	20

Table Routes

This table contains basic required information about routes of our subway system.

Table Name	Field name	Field Description	Data Type
routes	route_id	Unique line Identifier, Primary Key, Autoincrement	Int
	route_type	Type of the route (technical / transport / service and etc.)	VARCHAR (50)
	req_number_of_employees	Required number of employees to provide consistent work of the subway line	Int

Route means a connection line between stations.

Example with data:

route_id	route_type	req_number_of_employees
1	Service	2

Table Trains

This table contains basic required information about trains in our subway system.

Table Name	Field name	Field Description	Data Type
trains	train_id	Unique train Identifier, Primary Key, Autoincrement	Int
	train_name	Name (Number) of the train	VARCHAR (50)
	req_number_of_employees	Required number of employees to provide consistent work of the subway train	Int

Example with data:

train_id	train_name	req_number_of_employees
1	12BG231B GeorgiaTrainCompany	3

Table Tracks

This table contains basic required information about tracks in our subway system.

Table Name	Field name	Field Description	Data Type
tracks	track_id	Unique track Identifier, Primary Key, Autoincrement	Int
	track_name	Name of the track	VARCHAR (50)

Example with data:

track_id	track_name
1	FF312R1

Table Tunnels

This table contains basic required information about tunnels in our subway system.

Table Name	Field name	Field Description	Data Type
tunnels	tunnel_id	Unique tunnel Identifier, Primary Key, Autoincrement	Int
	tunnel_name	Name of the tunnel	VARCHAR (50)

Example with data:

tunnel_id	tunnel_name
1	311122DDG1

Table Stations_Lines

Many-to-many table for creating connection between stations and lines in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
stations_lines	station_id	Unique station Identifier, Foreign Key	Int
	line_id	Unique line Identifier, Foreign Key	Int

Example with data:

station_id	line_id
1	1
1	2

Table Routes_trains

Many-to-many table for creating connection between routes and trains in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
routes_trains	route_id	Unique route Identifier, Foreign Key	Int
	train_id	Unique train Identifier, Foreign Key	Int

Example with data:

route_id	train_id
1	1
1	2

Table Routes_Lines

Many-to-many table for creating connection between routes and lines in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
routes_lines	route_id	Unique route Identifier, Foreign Key	Int
	line_id	Unique line Identifier, Foreign Key	Int

Example with data:

route_id	line_id
1	1
1	2

Table Lines_Tunnels

Many-to-many table for creating connection between lines and tunnels in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
lines_tunnels	line_id	Unique line Identifier, Foreign Key	Int
	tunnel_id	Unique tunnel Identifier, Foreign Key	Int

Example with data:

line_id	tunnel_id
1	1
1	2

Table Tickets_Stations

Many-to-many table for creating connection between tickets and stations in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
tickets_stations	ticket_id	Unique ticket Identifier, Foreign Key	Int
	station_id	Unique station Identifier, Foreign Key	Int
	time_of_use	Time when the ticket was used to access subway on the station	DATETIME

Example with data:

ticket_id	station_id	time_of_use
1	1	2024-03-27 14:46:05
1	2	2024-01-12 08:11:59

Table Tunnel_tracks

Many-to-many table for creating connection between tunnels and tracks in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
Tunnel_tracks	tunnel_id	Unique tunnel Identifier, Foreign Key	Int
	track_id	Unique track Identifier, Foreign Key	Int

Example with data:

tunnel_id	track_id
1	1
1	2

Table Lines_Trains

Many-to-many table for creating connection between lines and trains in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
lines_trains	line_id	Unique line Identifier, Foreign Key	Int
	train_id	Unique train Identifier, Foreign Key	Int

Example with data:

line_id	train_id
1	1
1	2

Table Routes_Stations

Many-to-many table for creating connection between routes and stations in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
routes_stations	route_id	Unique route Identifier, Foreign Key	Int
	station_id	Unique station Identifier, Foreign Key	Int

Example with data:

route_id	station_id
1	1
1	2

Table Trains_employees

Many-to-many table for creating connection between trains and employees in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
trains_employees	train_id	Unique train Identifier, Foreign Key	Int
	employee_id	Unique employee Identifier, Foreign Key	Int

Employees in subways can switch several trains in one shift.

Example with data:

train_id	employee_id
1	1
1	2

Table Trains_arrivals_departures

Many-to-many table for creating connection of trains arrival and departures on stations in order to follow 3NF of database. It also has additional arrival_departure_id, arrival_time and departure_time for more convenient representation and storing of data.

Table Name	Field name	Field Description	Data Type
trains_arrivals_departures	arrival_departure_id	Unique arrival_departure Identifier, Primary Key, Autoincrement	Int
	train_id	Unique train Identifier, Foreign Key	Int
	station_id	Unique station Identifier, Foreign Key	Int
	arrival_time	Time of train arrival at the station	DATETIME
	departure_time	Time of train departure from the station	DATETIME

Example with data:

arrival_departure_id	train_id	station_id	arrival_time	departure_time
1	1	1	2024-03-27 14:43:05	2024-03-27 14:46:05

Table Stations_Employees

Many-to-many table for creating connection between stations and employees in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
stations_employees	station_id	Unique station Identifier, Foreign Key	Int
	employee_id	Unique employee Identifier, Foreign Key	Int

Example with data:

station_id	employee_id
1	1
1	2

Table Employees

This table contains basic required information about employees of our subway system.

Table Name	Field name	Field Description	Data Type
employees	employee_id	Unique employee Identifier, Primary Key, Autoincrement	Int
	employee_name	Name of the employee	VARCHAR (50)
	employee_role	Role (profession) of employee	VARCHAR (50)

Example with data:

employee_id	employee_name	employee_role
1	Georgi Panishvilli	Mechanic

Table Employees_Shifts

Many-to-many table for creating connection between employees and shifts in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
employees_shifts	employee_id	Unique employee Identifier, Foreign Key	Int
	shift_id	Unique shift Identifier, Foreign Key	Int

Example with data:

employee_id	shift_id
1	1
1	2

Table Shifts

This table contains basic required information about standard employee shifts of our subway system.

Table Name	Field name	Field Description	Data Type
shifts	shift_id	Unique shift Identifier, Primary Key, Autoincrement	Int
	shift_startTime	Start of the shift	DATETIME
	shift_endTime	End of the shift	DATETIME

Example with data:

shift_id	shift_startTime	shift_endTime
1	2024-03-27 08:00:00	2024-03-27 17:30:00

Table Stations_Maintances

Many-to-many table for creating connection between stations and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
stations_maintances	station_id	Unique station Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

station_id	maintance_id
1	1
1	2

Table Lines_Maintances

Many-to-many table for creating connection between lines and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
lines_maintances	line_id	Unique line Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

line_id	maintance_id
1	1
1	2

Table Trains_Maintances

Many-to-many table for creating connection between trains and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
trains_maintances	train_id	Unique train Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

train_id	maintance_id
1	1
1	2

Table Routes_Maintances

Many-to-many table for creating connection between lines and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
routes_maintances	route_id	Unique route Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

route_id	maintance_id
1	1
1	2

Table Tunnels_Maintances

Many-to-many table for creating connection between tunnels and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
tunnels_maintances	tunnel_id	Unique tunnel Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

tunnel_id	maintance_id
1	1
1	2

Table Tracks_Maintances

Many-to-many table for creating connection between tracks and maintance schedule in order to follow 3NF of database.

Table Name	Field name	Field Description	Data Type
tracks_maintances	track_id	Unique route Identifier, Foreign Key	Int
	maintance_id	Unique maintance Identifier, Foreign Key	Int

Example with data:

track_id	maintance_id
1	1
1	2

Table Maintance

This table contains basic required information about maintance schedule in our subway system.

Table Name	Field name	Field Description	Data Type
maintance	maintance_id	Unique maintance Identifier, Primary Key, Autoincrement	Int
	last_maintance_date	When previous maintance operations were executed	DATE
	estimated_maintance_date	When following maintance operations must be executed	DATE

Example with data:

maintance_id	last_maintance_date	estimated_maintance_date
1	2024-01-15	2025-01-15

Table Customers

This table contains basic required information about customers in our subway system.

Table Name	Field name	Field Description	Data Type
customers	customer_id	Unique customer Identifier, Primary Key, Autoincrement	Int
	ticket_id	Unique ticket Identifier, Foreign Key	Int
	customer_name	Name of the customer	VARCHAR (50)

Ticket_id has a One-to-One relation to Ticket_id in Ticket table.

Example with data:

customer_id	ticket_id	customer_name
1	1	Goga Pavliashvili

Table Tickets

This table contains basic required information about tickets of our subway system.

Table Name	Field name	Field Description	Data Type
tickets	ticket_id	Unique ticket Identifier, Primary Key, Autoincrement	Int
	ticket_type	Type of the ticket	VARCHAR (50)
	ticket_price	Price of the ticket	DECIMAL (6,2)
	ticket_discount	Discount applied to the ticket	DECIMAL (1,2)
	ticket_startTime	Time, when ticket starts working	DATETIME
	ticket_endTime	Time, when ticket stops working	DATETIME

Example with data:

ticket_id	ticket_type	ticket_price	ticket_discount	ticket_startTime	ticket_endTime
1	Limited	300.31	0.27	2024-03-27 17:30:00	2024-03-27 17:30:00