



## How to Model Relational Database Design with ERD?

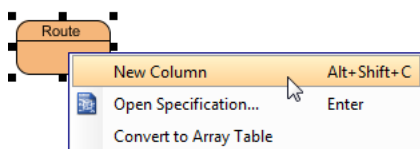
Written Date : August 24, 2015

The Entity-Relationship (ER) model was originally proposed by Peter Chen in 1976. An entity relationship diagram (ERD) is a graphical representation of entities and their relationships to each other, typically used for modeling the organization of data within databases or information systems.

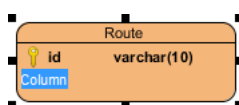
1. Create a new project by selecting **Project > New** from the application toolbar. In the **New Project** window, enter *Bus Route Management* as project name and click **Create Blank Project**.
2. To create an ERD, select **Diagram > New** from the toolbar. In the **New Diagram** window, select **Entity Relationship Diagram** and click **Next**. Enter *Bus Route Management* as diagram name and click **OK**.
3. Let's start by creating the first entity *Route*. Select **Entity** in diagram toolbar and click on the diagram to create an entity. Name the entity *Route* and press **Enter** to confirm.



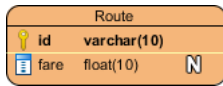
4. Create columns in *Route*. Let's start with a primary key. Right click on entity *Route* and select **New Column** from popup menu.



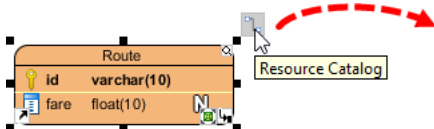
5. Enter *+id : varchar(10)* and press **Enter**. Note that the + sign means that the column is a primary key. Varchar is the column type and 10 is the length.



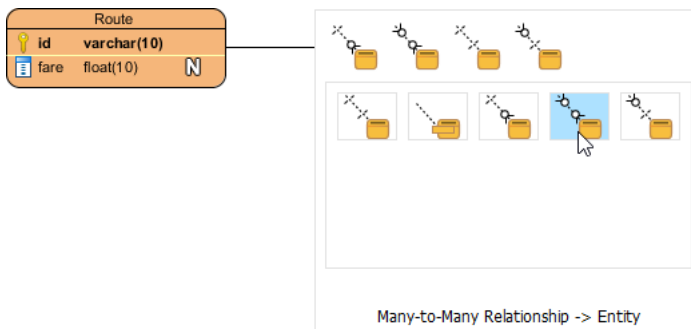
6. Enter *fare* : *float* and press **Enter**, then **Esc** to create another column.



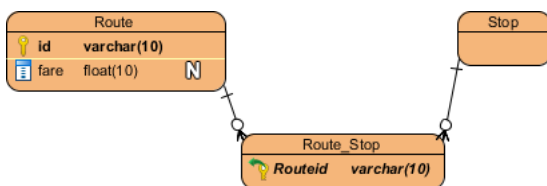
7. Create entity *Stop*. A bus route has many bus stops, while a stop can be shared by many routes. Therefore, there is a many-to-many relationship between *Route* and *Stop*. Place the mouse pointer over the *Route* entity. Drag out the **Resource Catalog** icon at top right.



8. Release the mouse button and select **Many-to-Many Relationship -> Entity** from Resource Catalog.



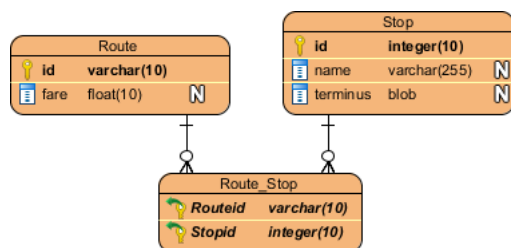
Name the new entity *Stop*, You can see that a linked entity *Route\_Stop* is automatically created in between *Route* and *Stop*, with foreign key added.



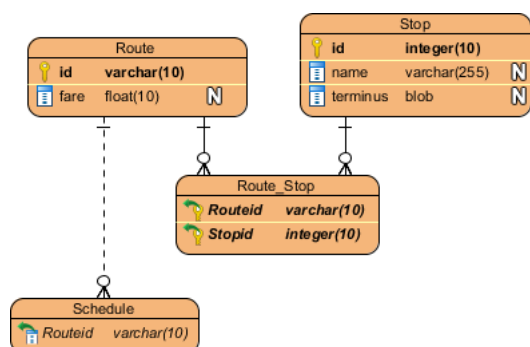
9. Create the following columns in *Stop*:

Key	Name	Type
PK	id	int(10)
	name	varchar(255)
	terminus	blob

The diagram should now become:



10. A route has multiple bus schedules. Create an entity *Schedule* from *Route* with a one-to-many relationship. Move the mouse pointer to *Route*. Press and drag out the **Resource Catalog** icon. Select **One-to-Many Relationship -> Entity** to create entity *Schedule*.



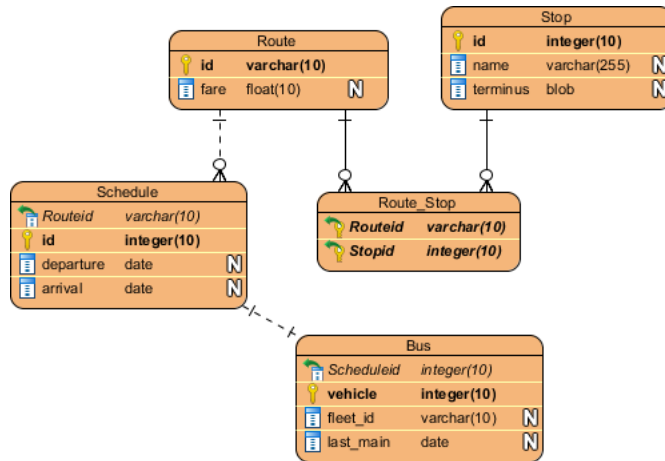
11. Create the following columns in *Schedule*:

Key	Name	Type
PK	id	int(10)
	departure	date
	arrive	date

12. A schedule is handled by a bus. Create an entity *Bus* from *Schedule*, with an one-to-one relationship. Create the following columns in *Bus*:

Key	Name	Type
PK	vehicle_id	int(10)
	fleet_id	varchar(10)
	last_main	date

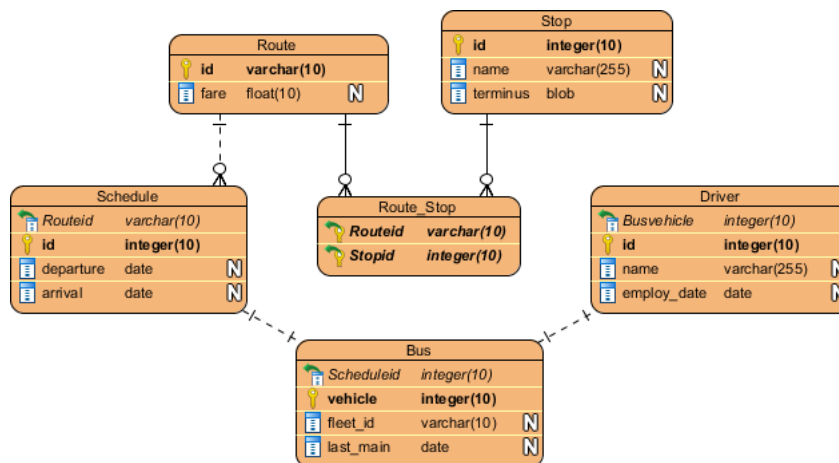
The diagram should become:



13. A bus is driven by a bus driver. Create entity *Driver* from *Bus* with a one-to-one relationship. Add the following columns to *Driver*:

Key	Name	Type
PK	id	int(10)
	name	varchar(255)
	employ_date	date

This is the final ERD.



#### Related Links

- [YouTube Video: How to Generate DDL from Your ERD](#)
- [YouTube Video: Draw Many to Many Relationship](#)
- [YouTube Video: Compare Logical and Physical Data Model Using Visual Diff](#)

- [What is Entity Relationship Diagram \(ERD\)?](#)
- [Visual Paradigm Tutorial: From Data Modeling to Data Dictionary](#)



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