BLACK MOUNTAIN

SQL SCREEN PREPARATION

At Black Mountain, many of our positions are somewhat technical. As such, we begin our application process with an online SQL Screen. We are looking for knowledge of the following:

- Database structure basics
  - Table Structure, Primary Keys
  - Data types
  - Relationships
    - One to One
    - One to Many
    - Many to Many

- Basic SQL Syntax
  - SELECT
  - FROM
  - WHERE, including AND & OR
  - GROUP BY, including common aggregation functions (SUM, AVG, MAX, etc.)
  - ORDER BY

- Understand JOINs
  - Multiple JOINS
  - INNER, OUTER, LEFT, RIGHT

- CASE statements, with multiple conditions and defaulted.

- UPDATE

- INSERT

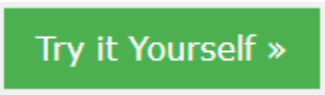
- DELETE

If you'd like to study prior to taking our SQL Screen, the following sources should help to learn or refresh your knowledge.

W3 Schools -- www.w3schools.com/sql/

- W3 Schools SQL tutorial is an excellent source for how to write SQL scripts.
  - Useful for first time learners as well as a refresher of basics
  - Has an excellent command quick reference (Link here)
  - Supports in browser editing, so you can type code and see the results

- How to use this page?
  - On the left of the page, there is a section labeled SQL Tutorial. Run through each of the examples there. Make use of the Try It Yourself buttons to sample code and see its results directly.
  - When you are satisfied with your understanding of the Tutorials, has a provided QUIZ you can use to self-test. (Link here)



SQL Zoo -- sqlzoo.net/wiki/SQL_Tutorial

- SQL Zoo has some higher-level problem sets, as compared to W3 Schools. Attempts to take basics, give you some data, and have you use those items to answer specific questions.
  - Supports in browser editing, so you can type code and see the results

- How to use this page?
  - Starting with the link on the upper left, SELECT basics, work your way through from top to bottom.
  - Notice that the Reference section, at the bottom of the list, opens up and gives you a reference of commands.

Khan Academy -- www.khanacademy.org/

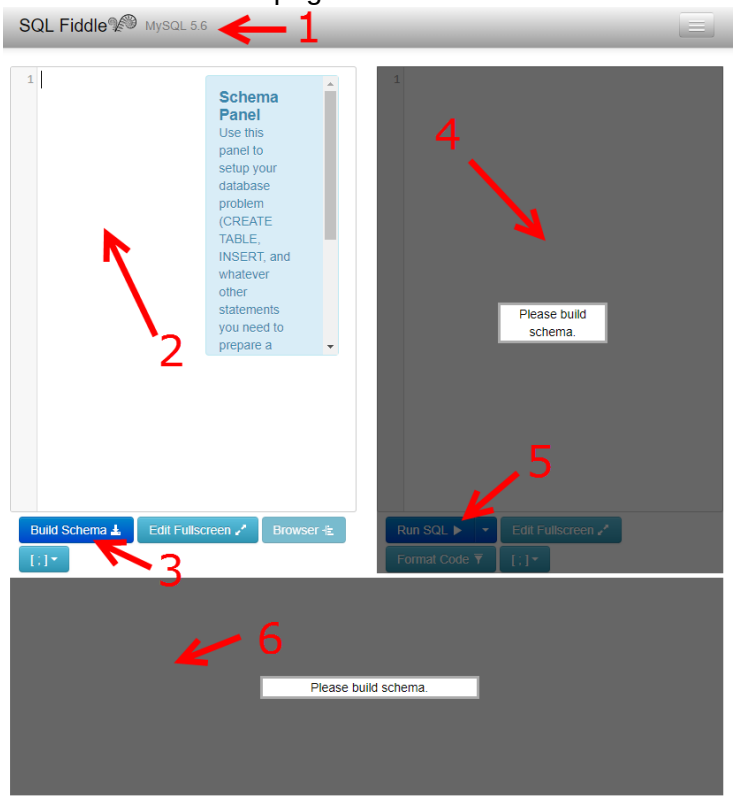
- An additional source to move through. If you learn better via movies, this site has you covered.

Lucid Chart -- www.lucidchart.com

- Less a scripting tutorial, more a database structure guide.
- Thought the whole article is interesting, for our purposes you need to be familiar with contents of these sections:
  - Database structure: the building blocks of a database
  - Creating relationships between entities

SQL Fiddle -- sqlfiddle.com/

- This site will let you insert the **Build Schema** code block, in order to have your own mini-database to play with. You will need to stage up the **Schema** and then can run commands against in the **Run SQL** window.
- How to use this page?



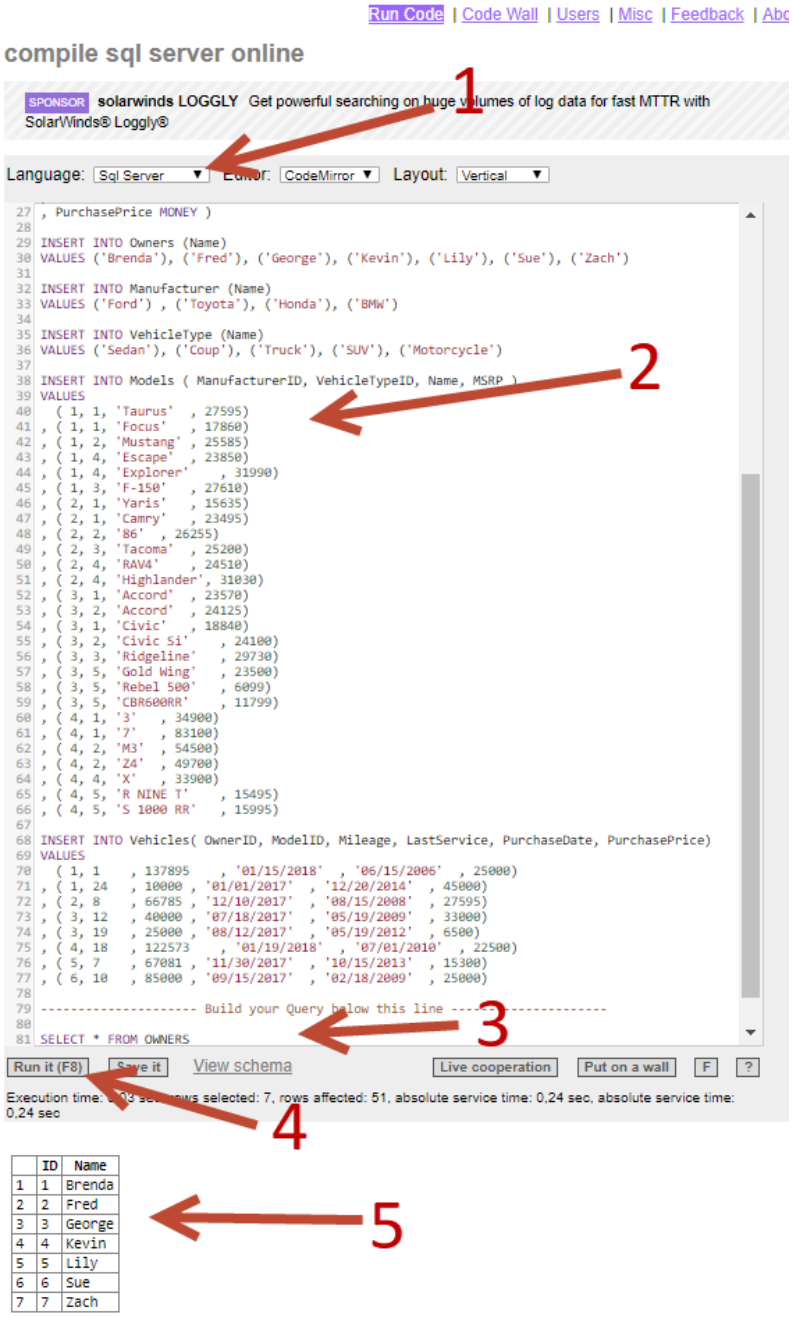
1. Change selection to MS SQL Server 2017
2. Copy paste the below **Build Schema** code block into this box.
3. Hit Build Schema
4. Enter your query here. ***You'll need to design these yourself.***
5. When you're satisfied with your script, hit here to run it.
6. This is the output of your code.

<u>Suggested Questions:</u>

How many vehicle models per manufacturer? Per Vehicle Type? How many cars does each owner possess? How many total miles are logged to each owner?

RexTester -- RexTester.com

- This site will let you insert the **Build Schema** code block, in order to have your own mini-database to play with. Unlike SQL Fiddle, there is no Schema Storage, so you'll simply have to execute the table setup at the top of any script you run.
- How to use this page?



1. Change the Selection to SQL Server
2. Replace the contents of the text editor with the provided **Build Schema**, below.
3. Come up with a question and build a query to answer it. ***You'll need to design these yourself.***
4. When your satisfied with your query, either hit this button or hit F8 on your keyboard to run it.
5. Look for the output of your query here.

<u>Suggested Questions:</u>

How many vehicle models per manufacturer? Per Vehicle Type? How many cars does each owner possess? How many total miles are logged to each owner?

Build Schema code, for use with SQL Fiddle or RexTester:

```
CREATE TABLE Owners
( ID                            INT IDENTITY(1,1)
, Name                          VARCHAR(50) )

CREATE TABLE Manufacturer
( ID                            INT IDENTITY(1,1)
, Name                          VARCHAR(255) )

CREATE TABLE VehicleType
( ID                            INT IDENTITY(1,1)
, Name                          VARCHAR(255) )

CREATE TABLE Models
( ID                            INT IDENTITY(1,1)
, ManufacturerID                INT
, VehicleTypeID                 INT
, Name                          VARCHAR(255)
, MSRP                          MONEY )

CREATE TABLE Vehicles
( ID       INT IDENTITY(1,1)
, OwnerID  INT
, ModelID  INT
, Mileage  INT
, LastService         DATETIME
, PurchaseDate        DATETIME
, PurchasePrice       MONEY )

INSERT INTO Owners (Name)
VALUES ('Brenda'), ('Fred'), ('George'), ('Kevin'), ('Lily'), ('Sue'), ('Zach')

INSERT INTO Manufacturer (Name)
VALUES ('Ford') , ('Toyota'), ('Honda'), ('BMW')

INSERT INTO VehicleType (Name)
VALUES ('Sedan'), ('Coup'), ('Truck'), ('SUV'), ('Motorcycle')

INSERT INTO Models ( ManufacturerID, VehicleTypeID, Name, MSRP )
VALUES
  ( 1, 1, 'Taurus'    , 27595)
, ( 1, 1, 'Focus'     , 17860)
, ( 1, 2, 'Mustang'   , 25585)
, ( 1, 4, 'Escape'    , 23850)
, ( 1, 4, 'Explorer'  , 31990)
, ( 1, 3, 'F-150'     , 27610)
, ( 2, 1, 'Yaris'     , 15635)
, ( 2, 1, 'Camry'     , 23495)
, ( 2, 2, '86'        , 26255)
, ( 2, 3, 'Tacoma'    , 25200)
, ( 2, 4, 'RAV4'      , 24510)
, ( 2, 4, 'Highlander', 31030)
, ( 3, 1, 'Accord'    , 23570)
, ( 3, 2, 'Accord'    , 24125)
, ( 3, 1, 'Civic'     , 18840)
, ( 3, 2, 'Civic Si'  , 24100)
, ( 3, 3, 'Ridgeline' , 29730)
, ( 3, 5, 'Gold Wing' , 23500)
, ( 3, 5, 'Rebel 500' , 6099)
, ( 3, 5, 'CBR600RR'  , 11799)
, ( 4, 1, '3'         , 34900)
, ( 4, 1, '7'         , 83100)
, ( 4, 2, 'M3'        , 54500)
, ( 4, 2, 'Z4'        , 49700)
, ( 4, 4, 'X'         , 33900)
, ( 4, 5, 'R NINE T'  , 15495)
, ( 4, 5, 'S 1000 RR' , 15995)

INSERT INTO Vehicles( OwnerID, ModelID, Mileage, LastService, PurchaseDate, PurchasePrice)
VALUES
  ( 1, 1   , 137895   , '01/15/2018'        , '06/15/2006'        , 25000)
, ( 1, 24  , 10000    , '01/01/2017'        , '12/20/2014'        , 45000)
, ( 2, 8   , 66785    , '12/10/2017'        , '08/15/2008'        , 27595)
, ( 3, 12  , 40000    , '07/18/2017'        , '05/19/2009'        , 33000)
, ( 3, 19  , 25000    , '08/12/2017'        , '05/19/2012'        , 6500)
, ( 4, 18  , 122573   , '01/19/2018'        , '07/01/2010'        , 22500)
, ( 5, 7   , 67081    , '11/30/2017'        , '10/15/2013'        , 15300)
, ( 6, 10  , 85000    , '09/15/2017'        , '02/18/2009'        , 25000)

---------------------- For Rextester, Build your Query below this line ------------------
```