

Introduction to Databases

Question	Answers
What type of database type does Shodor use?	A relational database
What DBMS does Shodor use?	MySQL

MySQL Syntax Guide: Day 1

SQL	MySQL Syntax	Results
Building Table and Table Info	Write proper SQL syntax to query the People table using Sequel Pro.	What Was the Result
CREATE TABLE Step1:	<pre>CREATE TABLE People (id int(11) unsigned NOT NULL auto_increment, firstName varchar(255) default NULL, lastName varchar(255) default NULL, favColor varchar(255) default NULL, shoeSize decimal (3,1)default NULL, PRIMARY KEY (id)) ENGINE=InnoDB DEFAULT CHARSET=utf8;</pre>	Creates a table with the name People, the primary key is the id, and it has a firstname field, lastname field, favColor field, and shoeSize field.
SHOW TABLE	SHOW TABLES;	Shows all the tables in the database
DESCRIBE TABLE	DESCRIBE People;	Describes the ids and the data types of the table
DROP TABLE (*Don't Do unless you really want to get rid of a table and all its data. You will have to start over.)	DROP TABLE People;	DO NOT RUN this query unless you want to destroy a table and data. Once done it

DO NOT RUN QUERY!		cannot be undone.
INSERT INTO Step2:	<pre> INSERT INTO People (firstName, lastName,favColor, shoeSize) VALUES ('Ernie','Edinboro','Orange',11.5), ('Gustavo','Nunez-Vivanco','Blue',9.5), ('Chris','Parker','Red',10), ('Huny','Chung','Light Green',9), ('Aaron','Weeden','Purple',10), ('No','Hope','Black',4), ('Shawn','Kang','Red',10), ('Divya','Aikat','Purple',9.5), ('Michael','Allen Dacany','Blue',12), ('Naylea ','Jacobob','Blue',7.5), ('Mihir','Khadri','Red',10.5), ('Krista','Katzenmeyer','Cupcake',8.5), ('Erica','Aiello','Yellow',3), ('Joel','Coldren','Green',13.5), ('Rohin','Shahi','Red',12.5), ('Ameya','Rao','Blue',9.5), ('Luka','Ashe-Jones','Orange',8), ('Ernie','Edinboro','Blue',12), ('Ernie','Edinboro','Green',11), ('Leanne','Chan','Green',6), ('Erica','Aiello','Purple',3.5); </pre>	Adds these entries to the table
NOT NULL	<pre> CREATE TABLE Products (ID int unsigned NOT NULL auto_increment, price int NOT NULL, productName varchar(225) NOT NULL, PRIMARY KEY (id),)ENGINE=InnoDB DEFAULT CHARSET=utf8; </pre>	Ensures that you must have a value in each of these fields for an entry
PRIMARY KEY	<pre> CREATE TABLE Products (ID int unsigned NOT NULL auto_increment, price int NOT NULL, productName varchar(225) NOT NULL, PRIMARY KEY (id),)ENGINE=InnoDB DEFAULT CHARSET=utf8; </pre>	The primary key here is the id, so it comes first, and the list is ordered based on the id
AUTO_INCREMENT	<pre> CREATE TABLE Products (ID int unsigned NOT NULL auto_increment, price int NOT NULL, </pre>	The id auto increments at each entry by 1

	<pre> productName varchar(225) NOT NULL, PRIMARY KEY (id),)ENGINE=InnoDB DEFAULT CHARSET=utf8; </pre>	
ALTER Step3:	<pre> ALTER TABLE People ADD coinFlip VARCHAR(5) NOT NULL; </pre>	Adds another field called coinFlip
DELETE Be careful! DO NOT RUN QUERY!	<pre> DELETE FROM People WHERE id=1; </pre>	Do not run query
Ernie's FREEBIE! Add Data to the newly created coinFlip field. Step4:	<pre> INSERT INTO People (id, coinFlip) VALUES ('1','Tails'),('2','Tails'),('3','Tails'), ('4','Heads'),('5','Heads'),('6','Tails'), ('7','Heads'),('8','Tails'),('9','Heads'), ('10','Heads'),('11','Tails'),('12','Heads'), ('13','Heads'),('14','Heads'),('15','Tails'), ('16','Heads'),('17','Heads'),('18','Heads'), ('19','Heads'),('20','Tails'),('21','Heads') ON DUPLICATE KEY UPDATE id=VALUES(id), coinFlip=VALUES(coinFlip); </pre>	Adds the data for the coinFlip
Useful SQL Syntax		
UPDATE	<pre> UPDATE People SET firstName='Ernest' WHERE id=1; </pre>	The first row was affected: the firstName changed from Ernie to Ernest
SELECT	<pre> SELECT favColor FROM People; </pre>	Displayed the favColor column of all entries
WHERE	<pre> SELECT shoeSize FROM People WHERE favColor= 'Blue'; </pre>	Displayed the shoeSize of people whose favorite color was blue
ORDER BY	<pre> SELECT * FROM People ORDER BY favColor; (default is ascending) To do descending: DESC </pre>	Orders entries in alphabetical order by color
AND, OR, Not	(used in the where clause)	AND: the first names of

	<pre>SELECT firstName FROM People WHERE favColor= 'Blue' AND coinFlip= 'Heads'; SELECT firstName FROM People WHERE favColor= 'Blue' OR favColor= 'Green'; SELECT firstName FROM People WHERE NOT coinFlip= 'Tails';</pre>	<p>those whose favColor was blue, and the coin flipped as heads showed up</p> <p>OR: first names of those whose favColor was blue or green</p> <p>NOT: those with a heads flip</p>
Count, Avg, Sum	<pre>SELECT COUNT(favColor) FROM People; SELECT AVG(shoeSize) FROM People; SELECT SUM(shoeSize) FROM People WHERE favColor='Blue';</pre>	<p>Returns 21</p> <p>Returns 9.09524</p> <p>Returns 50.5</p>
LIKE	<pre>SELECT lastName FROM People WHERE favColor LIKE 'b%';</pre>	<p>Displayed the lastnames of anyone whose favColor was blue or black</p>
IN	<pre>SELECT * FROM People WHERE favColor IN ('Blue', 'Green', 'Red');</pre>	<p>Displayed all entries with favColor green, red, or blue</p>
BETWEEN	<pre>SELECT * FROM People WHERE shoeSize BETWEEN 6 AND 9;</pre>	<p>Displayed all entries with shoe size between 6 and 9</p>
ALIAS		
SQL Operators	Best to use Arithmetic and Comparison Operators on shoeSize field	
Arithmetic Operators		
Add	<pre>SELECT 30 + 10;</pre>	40

Subtraction	SELECT 30 - 10;	20
Multiplication	SELECT 5*3;	15
Division	SELECT 20/5;	4.0000
Modulus	SELECT 42%10;	2
Comparison Operators		
Equal to	SELECT lastName FROM People WHERE shoeSize = 9;	Chung
Greater than >	SELECT firstName FROM People WHERE shoeSize > 8;	Ernest Gustavo Chris Huny Aaron Shawn Divya Michael Mihir Krista Joel Rohin Ameya Ernie Ernie Keith
Less than <	SELECT firstName FROM People WHERE shoeSize < 8;	No Naylea Erica Leanne Erica
Greater than equal to >=	SELECT firstName FROM People WHERE shoeSize >= 10;	Ernest Chris Aaron Shawn Michael Mihir Joel

		Rohin Ernie Ernie Keith
Less than equal to <=	<pre>SELECT firstName FROM People WHERE shoeSize <= 10;</pre>	Gustavo Chris Huny Aaron No Shawn Divya Naylea Krista Erica Ameya Luka Leanne Erica
Not equal to <>	<pre>SELECT firstName FROM People WHERE shoeSize <> 1</pre>	Ernest Gustavo Huny No Divya Michael Naylea Mihir Krista Erica Joel Rohin Ameya Luka Ernie Ernie Leanne Erica Keith
List 10 SQL Data Types	What types of Data do they Store?	
CHARACTER(n)	This data type stores a character which has a fixed length of n	

BOOLEAN	This data type stores true or false values	
DECIMAL(p,s)	This stores a decimal that has p-s values before the decimal and s values after the decimal	
TIME	Stores hour, minute, and second values	
SMALLINT	Stores an integer with max 5 values	
BINARY(n)	Binary string with a fixed length of n (ex BINARY(6) = 011001)	
DATE	Stores month, day, and year values	
ARRAY	Set length and ordered collection of elements	
XML	Stores xml data	
BIGINT	Integer with max of 19 values	
SQL MINI Challenge	Write SQL query to answer the questions	Result
What is Erica's favorite color?	<pre>SELECT favColor FROM People WHERE firstName='Erica';</pre>	Two results show up: Purple and Yellow This is because Erica has two entries in the database
Whose shoe size is 3? Show First and last name	<pre>SELECT firstName, lastName FROM People WHERE shoeSize= 3;</pre>	Erica Aiello
Whose favorite color is Cupcake? Show First Name only	<pre>SELECT firstName FROM People WHERE favColor= 'Cupcake';</pre>	Krista
What is the average shoe size?	<pre>SELECT AVG(shoeSize) FROM People;</pre>	9.09524
Whose favorite color is Red? Show Last Name only ORDER BY ASCending order.	<pre>SELECT lastName FROM People WHERE favColor= 'Red' ORDER BY lastName;</pre>	Kang Khadri Parker Shahi

What is the favorite color of people with shoe size 10?	<pre>SELECT favColor FROM People WHERE shoeSize= 10;</pre>	Red Purple Red
Select all data for user(s) id =13	<pre>SELECT * FROM People WHERE id=13;</pre>	13 Erica Aiello Yellow3.0 Heads
Select first name for user(s) where favorite color is red	<pre>SELECT firstName FROM People WHERE favColor='Red';</pre>	Chris Shawn Mihir Rohin
Select favorite color where shoe size greater than or equal to 12	<pre>SELECT favColor FROM People WHERE shoeSize>=12;</pre>	Blue Green Red Blue
Select shoe size where first name = Joel	<pre>SELECT shoeSize FROM People WHERE firstName='Joel';</pre>	13.5
Select lastname where favorite color is black	<pre>SELECT lastName FROM People WHERE favColor='Black';</pre>	Hope
Insert into People Keith,Kelly, Black, 11, Tails	<pre>INSERT INTO People (firstName, lastName,favColor, shoeSize, coinFlip) VALUES ('Keith', 'Kelley', 'Black', 11, 'Tails');</pre>	22 Keith KelleyBlack 11.0 Tails Added to table
Update First name of id 1 to Ernest	<pre>UPDATE People SET firstName='Ernest' WHERE id=1;</pre>	Changes to Ernest

MySQL Syntax Guide: Day 2

Database Interaction	MySQL Syntax using People table	What were the results?
PRIMARY KEY	<code>PRIMARY KEY (id),</code>	This makes the primary key id, the very first column
FOREIGN KEY	<code>FOREIGN KEY (peopleId) REFERENCES People (id)</code>	This takes the id from the People table and makes it peopleId in your new table
JOIN		
INNER JOIN	<code>SELECT * FROM CoinFlip INNER JOIN People4 ON CoinFlip.peopleId = People4.id</code>	Shows all data that has the same id and peopleId
LEFT JOIN	<code>SELECT * FROM CoinFlip LEFT JOIN People4 ON CoinFlip.peopleId = People4.id</code>	Takes all the information from People and the overlapping info from CoinFlip
RIGHT JOIN	<code>SELECT * FROM CoinFlip RIGHT JOIN People4 ON CoinFlip.peopleId = People4.id</code>	Takes all the information from CoinFlip and the overlapping info from People
GROUP BY	<code>SELECT COUNT(peopleId), color FROM FavColor GROUP BY color;</code>	<pre> 1 Blue 1 Green 1 Purple 2 Red </pre>
SQL Snippet for creating Relational DB	<code>CONSTRAINT CoinFlip_ibfk_1</code>	Adds another field that

	FOREIGN KEY (peopleId) REFERENCES People (id) ON DELETE CASCADE ON UPDATE CASCADE	has the same id as the People table
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