

Outline

1. What is a Query? Query Language?
2. **Example Database Tables**
3. SQL Overview: 3 Components
4. SELECT statement with 1 table
5. Multi-table SELECT statements
6. Why spatial extensions are needed?
7. 1-table spatial queries
8. Multi-table spatial queries
9. Trends



Learning Objectives

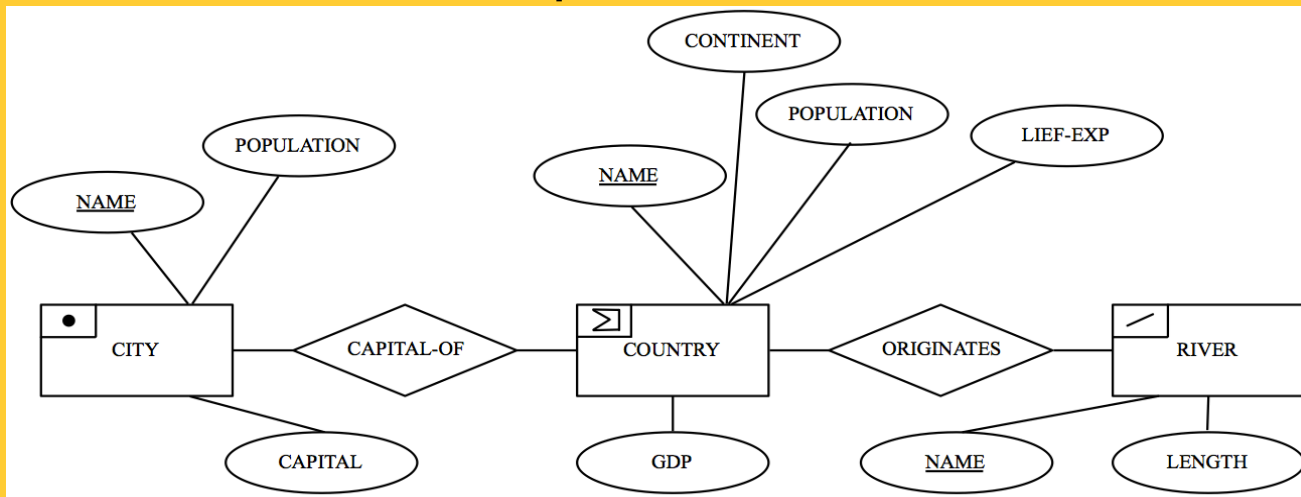
- Upon completion of this module, students will be able to
 - Describe a simple SQL database with 3 tables
 - These will be used to illustrate SQL statements
 - Describe 3 parts of SQL language

Example: World Database

- Purpose: use an example database to learn query language SQL
- Conceptual model
 - 3 Entities: country, city, river
 - 2 Relationships: capital-of, originates

World Database Conceptual Model

- Entity - relationship diagram using Chen's notation
 - 3 Entities: country, city, river shown as boxes
 - 2 Relationships: capital-of, originates shown as diamonds
 - Attributes shown as ellipses



World Database: Logical Model

- 3 Relations

Country (*Name, Cont, Pop, GDP, Life-Exp, Shape*)

City (*Name, Origin, Pop, Capital, Shape*)

River (*Name, Origin, Length, Shape*)

- Keys

- Primary keys are Country.Name, City.Name, River.Name
- Foreign keys are River.Origin, City.Country

- Data for 3 tables

- Shown on next slide

World Database Data Tables: Country

The **COUNTRY** table has 6 columns: Name, Continent (Cont), population (Pop), Gross domestic product (GDP), Life-expectancy (Life-exp) and Shape, Shape is boundary

COUNTRY	Name	Cont	Pop (millions)	GDP(billions)	Life-Exp	Shape
	Canada	NAM	30.1	658.0	77.08	Polygonid-1
	Mexico	NAM	107.5	694.3	69.36	Polygonid-2
	Brazil	SAM	183.3	1004.0	65.60	Polygonid-3
	Cuba	NAM	11.7	16.9	75.95	Polygonid-4
	USA	NAM	270.0	8003.0	75.75	Polygonid-5
	Argentina	SAM	36.3	348.2	70.75	Polygonid-6



World Database Data Tables: City

The **CITY** table has 5 columns, Name, Country, Population (Pop), Capital and Shape, Shape is a point.

CITY	Name	Country	Pop (millions)	Capital	Shape
	Havana	Cuba	2.1	Y	Pointid-1
	Washington, D.C.	USA	3.2	Y	Pointid-2
	Monterrey	Mexico	2.0	N	Pointid-3
	Toronto	Canada	3.4	N	Pointid-4
	Brasilia	Brazil	1.5	Y	Pointid-5
	Rosario	Argentina	1.1	N	Pointid-6
	Ottawa	Canada	0.8	Y	Pointid-7
	Mexico City	Mexico	14.1	Y	Pointid-8
	Buenos Aires	Argentina	10.75	Y	Pointid-9

World Database Data Tables: River

The **RIVER** table has 4 columns, Name, Origin, Length and Shape, Shape is a line.

RIVER	Name	Origin	Length (kilometers)	Shape
	Rio Parana	Brazil	2600	LineStringid-1
	St. Lawrence	USA	1200	LineStringid-2
	Rio Grande	USA	3000	LineStringid-3
	Mississippi	USA	6000	LineStringid-4

