Database schema examples

Launch lab

Instructions

Goal

Introduce an example of a database schema to demonstrate how data can be organized and related in tables.

Objectives

Understand how to design a database schema

The chinook database example

This exercise uses the well-known “chinook sample” database, which is widely used for example relational database demos and testing purposes. Also, it has been implemented in Coursera platform, which is good to be familiar with as well.
However, you are going to focus only on some of the main tables introduced in this database to highlight how a database schema is designed, and not the entire chinook schema.

Database schema design

Before you develop your actual database, you should design a relevant database schema to document the requirements and to propose an architecture of the database structure. To design a basic database schema, you need to apply the following steps:
Step 1: Define the database purpose.

Step 2: Identify the database tables including

Tables attributes

Attributes data types

Primary key for each table

Step 3: Create relationships between tables

Instructions

Please attempt the following tasks before you continue, so that you can check and compare your answers with the solution.
Task 1: Identify the database purposes.

Task 2: Identify 6 main tables with a brief description and a primary key for each table.

Task 3: Identify the relationships between the 6 main tables.

Task 4: Create an entity relationship diagram of the 6 main tables.

Note: This exercise can also be completed using a pencil and paper or any other suitable professional tool.

Task 1: Identify the database purpose

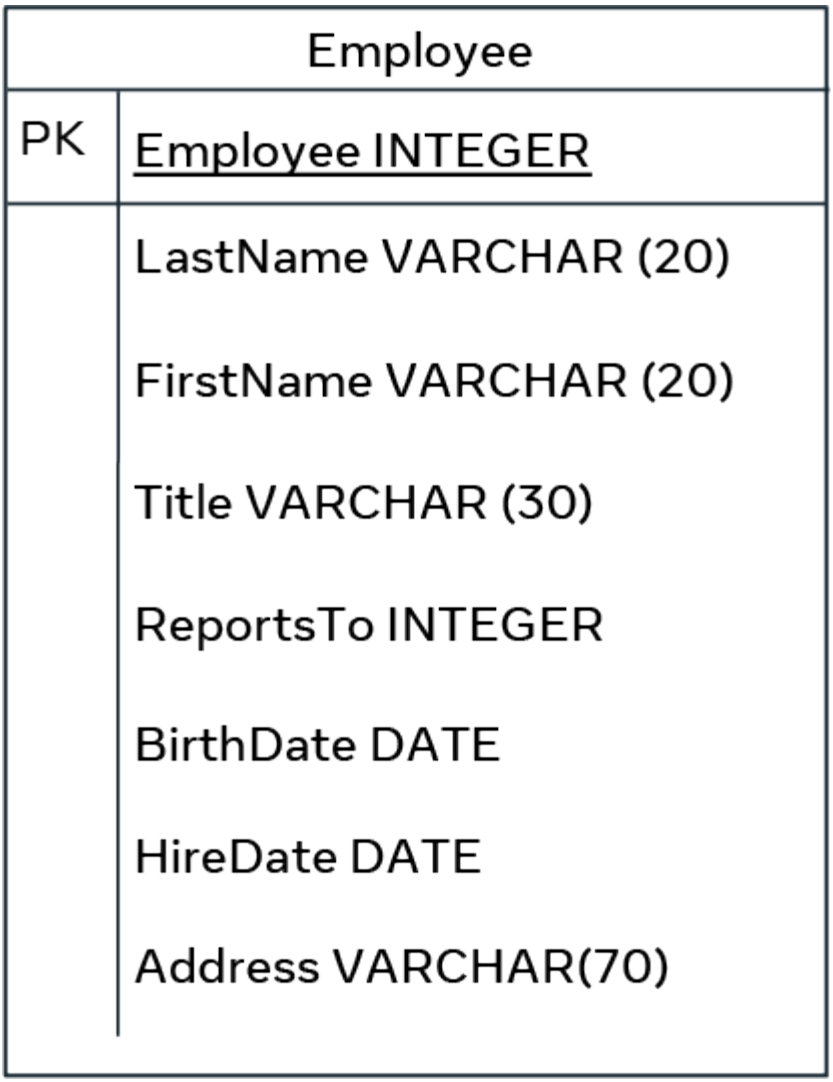
The “chinook sample” database represents a fictitious digital media company that includes information about artists, albums, media tracks, invoices and customers.

Task 2: Identify the database tables

The chinook sample database has considered adequate normalization level and created 11 tables to store and relate data to avoid data redundancy. However, this exercise will only focus on 6 main tables, including some relevant attributes for each.

Table name	Description	Diagram
Employees	The employee table stores the data of all employees. The diagram presents 8 attributes with relevant datatypes. Employee ID is the primary key in this table.	1
Customers	The customer table stores customers data. In the diagram, 8 attributes with relevant datatypes are presented. Customer ID is the primary key in this table.	2
Invoices	The invoice table stores data on invoices. In the diagram, 5 attributes with relevant datatypes are presented. Invoice ID is the primary key in this table.	3
Artists	The artist table stores data on artists. Only 2 attributes, the artist ID and artist name, are presented in the diagram alongside their relevant data types. Artists ID is the primary key in this table.	4
Albums	The album table stores data about a list of tracks. In the diagram, 3 attributes with relevant data types are presented. Album ID is the primary key in this table.	5
Tracks	The tracks table stores the data of songs. In the diagram there are 5 attributes with relevant data types. Tracks ID is the primary key in this table.	6

Diagram 1


Employee
PK
Employee INTEGER
LastName VARCHAR (20)
FirstName VARCHAR (20)
Title VARCHAR (30)
ReportsTo INTEGER
BirthDate DATE
HireDate DATE
Address VARCHAR(70)
Diagram 2

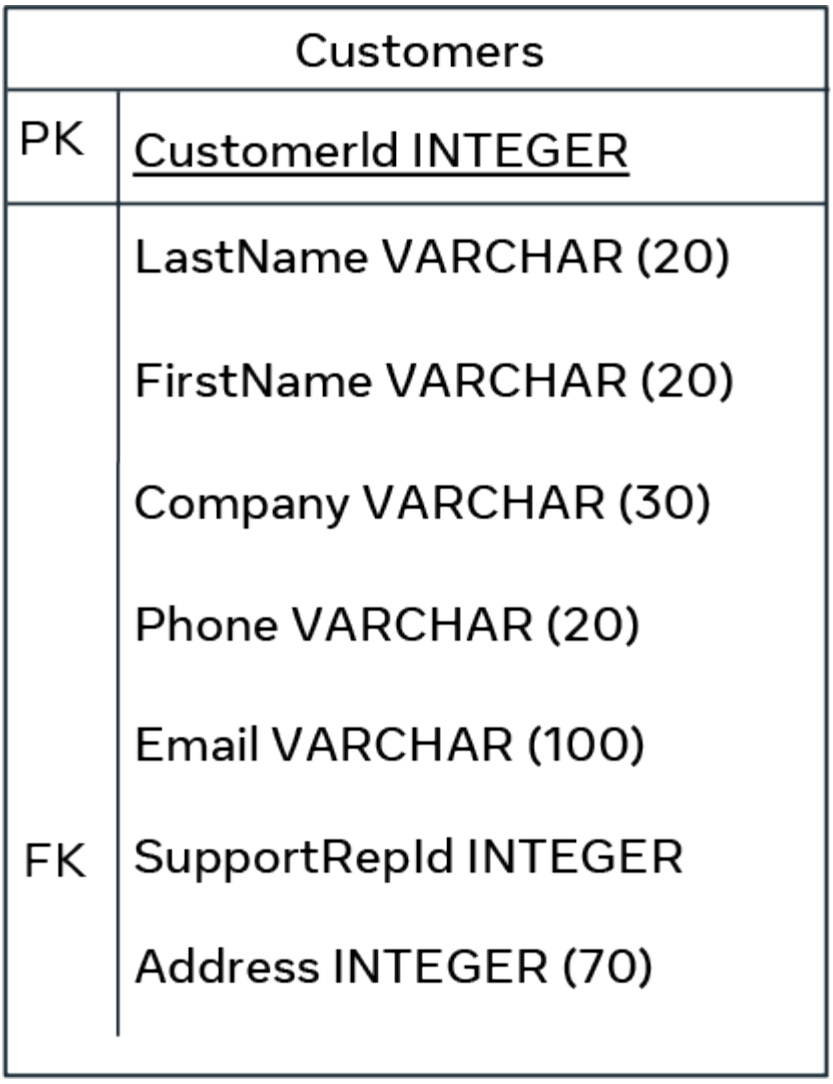


Diagram 3

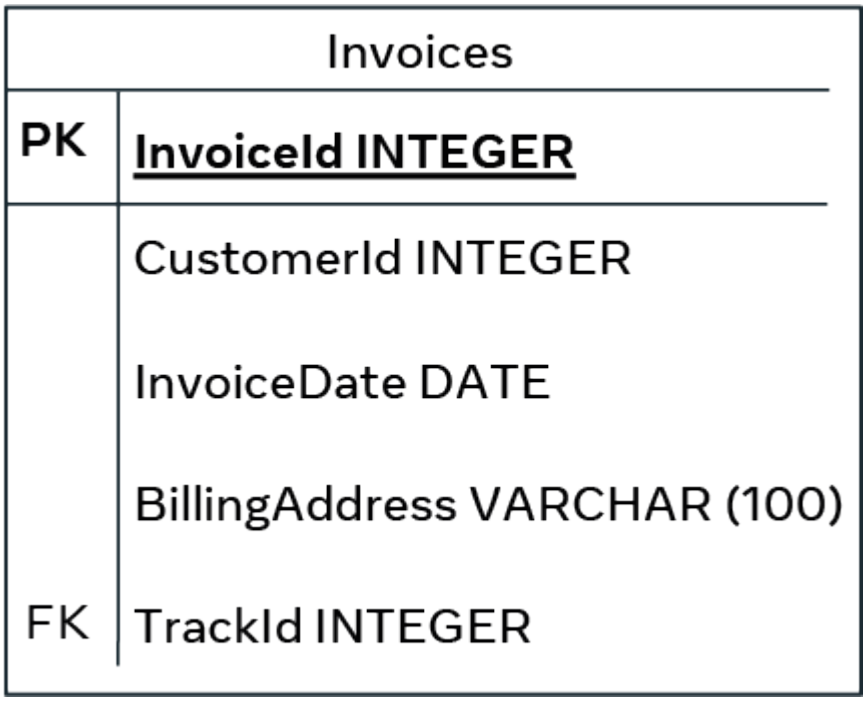


Diagram 4

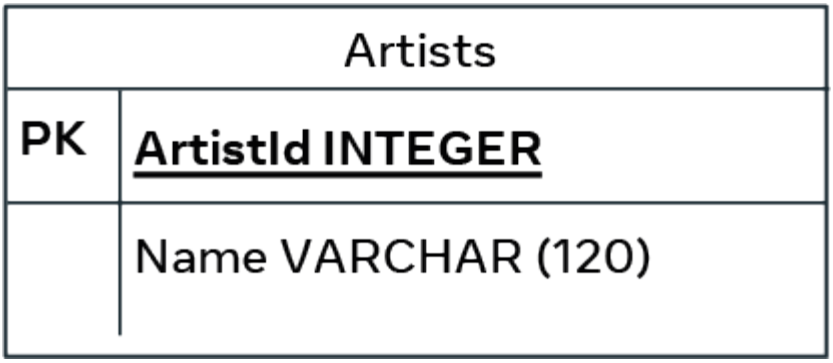


Diagram 5

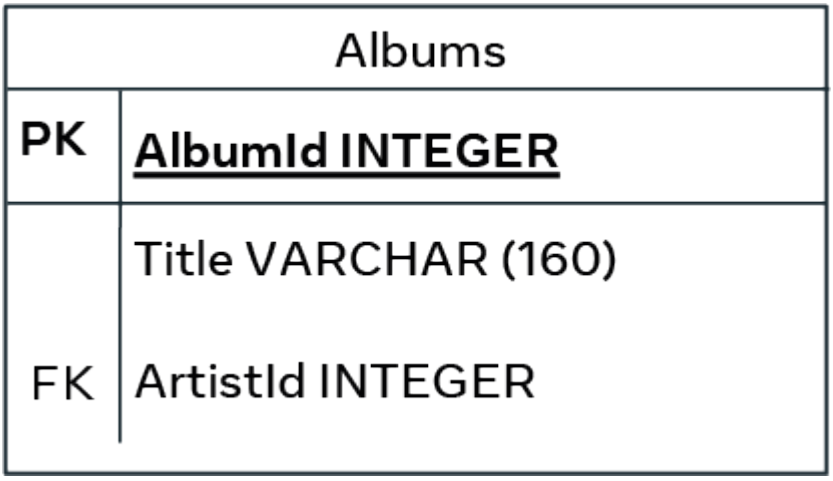
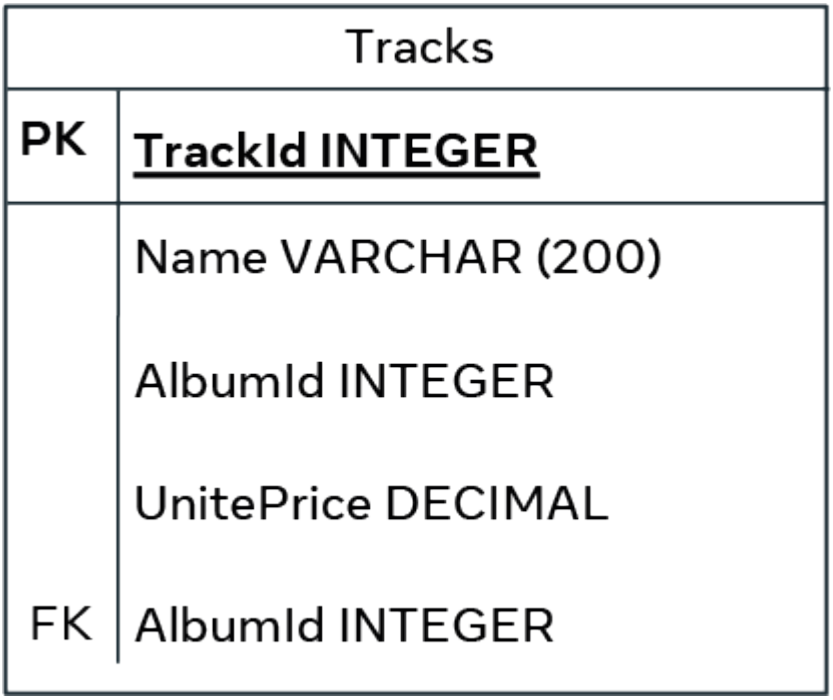


Diagram 6



Task 3: Identify relationships between tables

The chinook sample database defines the following relationships between the 6 stated tables:

Each employee will support one or many customers.

Each customer may have multiple invoices

Each track belongs to one album.

Each invoice relates to one track.

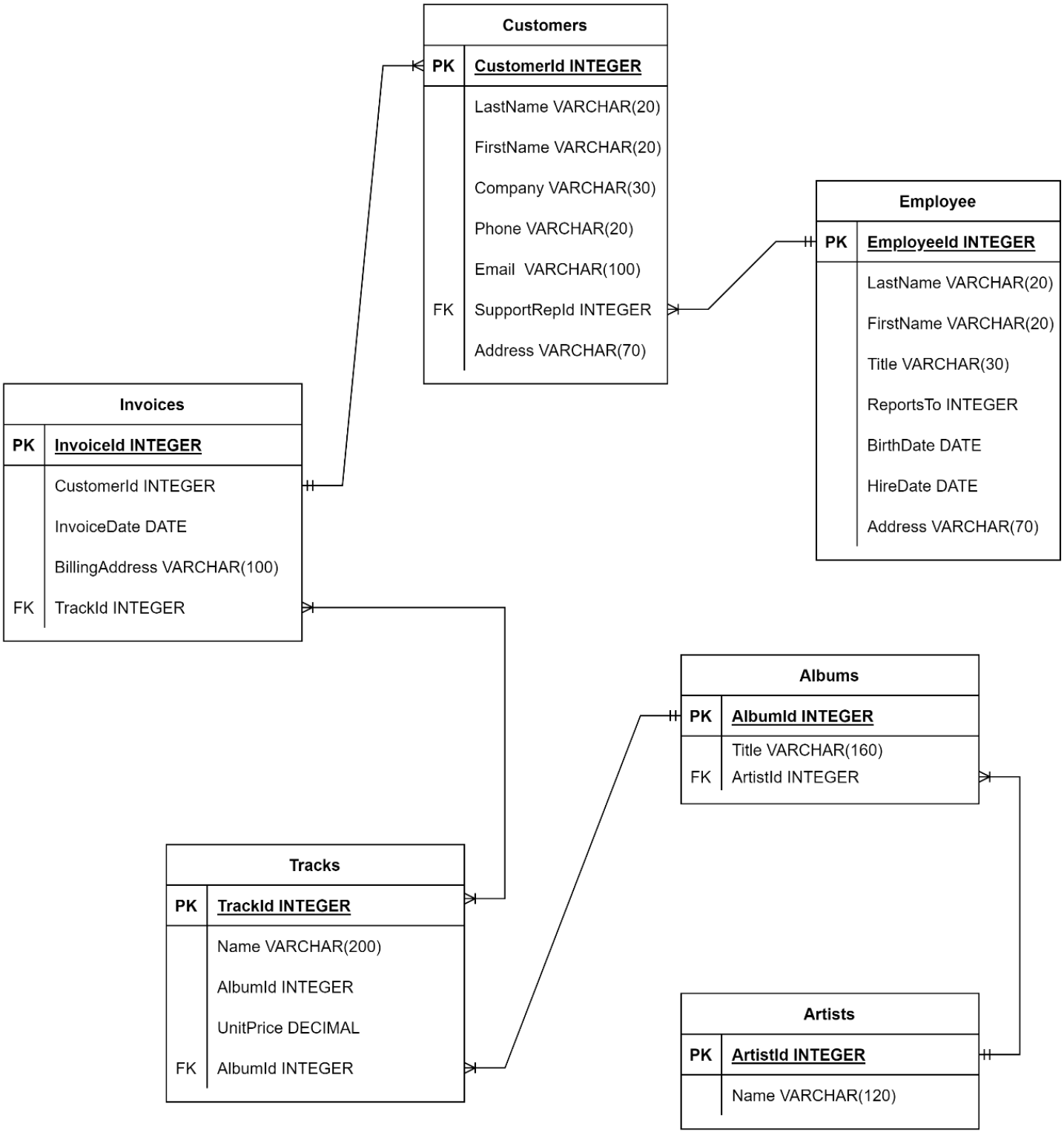
Each track belongs to one album

Each album may contain multiple tracks

Each artist has one or multiple albums

Task 4: Create entity relationship diagram

The final diagram connects all tables by using the FOREIGN KEYS as illustrated in the following diagram. Remember this is just a customized part of the chinook database schema. If you want to see the entire diagram you can check Appendix A.



Additional task (optional)

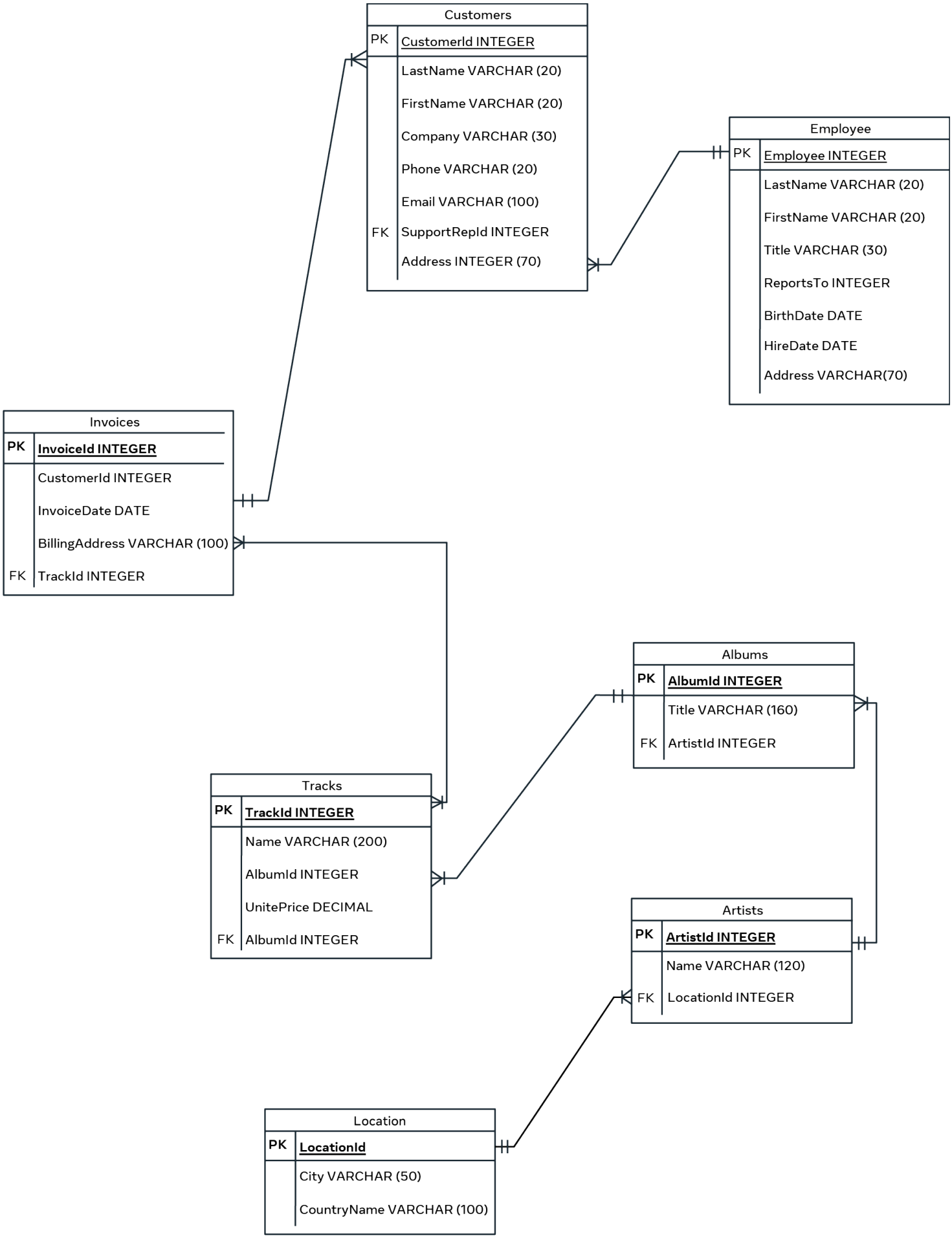
You are required to extend the customized chinook schema by adding a new table called "location" that shows the city and the country the artist lives in.

Solution

Add a new table called location

Add a foreign key “locationId” to the “Artists” table to connect it with the location table

The new chinook customized schema must look like the following ER-diagram:


Customers
PK CustomerId INTEGER
LastName VARCHAR (20)
FirstName VARCHAR (20)
Company VARCHAR (30)
Phone VARCHAR (20)
Email VARCHAR (100)
FK SupportRepId INTEGER
Address INTEGER (70)
Employee
PK Employee INTEGER
LastName VARCHAR (20)
FirstName VARCHAR (20)
Title VARCHAR (30)
ReportsTo INTEGER
BirthDate DATE
HireDate DATE
Address VARCHAR(70)
Invoices
PK InvoiceId INTEGER
CustomerId INTEGER
InvoiceDate DATE
BillingAddress VARCHAR (100)
FK TrackId INTEGER
Albums
PK AlbumId INTEGER
Title VARCHAR (160)
FK ArtistId INTEGER
Tracks
PK TrackId INTEGER
Name VARCHAR (200)
AlbumId INTEGER
UnitePrice DECIMAL
FK AlbumId INTEGER
Artists
PK ArtistId INTEGER
Name VARCHAR (120)
FK LocationId INTEGER
Location
PK LocationId
City VARCHAR (50)
CountryName VARCHAR (100)

Appendix A: the original Chinook database schema

The following diagram is a blueprint of the chinook database schema that shows how data is organized and related in tables.