1. Come up with some use cases in which a content provider would be helpful.

2. How does file streams work in JAVA?

3. Explain the process of implementing a content provider, and to get the info from a content provider.

4. What is a vector drawable and how do we implement and use them in android?

5. Define the following:

1. Content Resolver

2. Primary Key (Sql)

3. Foreign Key (Sql)

4. Relational Database

5. Dangerous Permissions

6. What is a ORM?

7. Explain how you would upgrade a Table in your database with a new column while preserving the data already in said table.

1). A content provider helps manage access to a central repository of data. For example, an application has its data securely maintained in it’s own database. Now, if a second application wants to access that data, a content provider component helps manage a secure connection for data transfer between these two apps. This is the case when using apps like Skype and Facebook which request access to your contacts to help you quickly link up with your friends. Another case would be a delivery service app that requests data from your map app in order to automatically fill in locations you typically visit, instead of you manually typing every location.

2). File streams, or I/O streams, is a sequence of data transfer between various kinds of sources and destinations such as files on your drive and computer programs. They also support many types of data including bytes, primitives, and objects. A common example of a byte stream is FileInputStream and FileOutputStream, used to read from and write to a file. It works like this:

1. A new FileInputStream object is created and an existing file is passed in. We use different methods like .read() to extract the information.
2. That information can then be placed in a new file, using the .write() of the FileOutputStream object.
3. At the end, close both streams using the .close() method to prevent any resource leaks.

3). To access data in the content provider, the app requesting the data will use a ContentResolver object. The content provider residing in the destination will respond with the data using a cursor. To get more specific on the steps:

1. The requesting app uses a method called getContentResolver(), which returns a content resolver object. We use this to communicate with the provider in the other app.
2. In order to reach the correct provider, we need the Uniform Resource Identifier associated with that content provider.
3. The Content Resolover provides various methods for communicating with the provider, like basic CRUD operations (create, read, update and delete) and Batch operations (tasks that can be executed with minimal or no user interaction).
4. Remember to add the content provider to the manifest.

4). A vector drawable is a graphic object defined in the XML that’s used for image scalability. A normal bitmap uses pixels that become blurry when scaled up. With Vector drawables, we can define an image geometrically, using a set of points, lines and curves. We create an image once as an XML that can be scaled for all dpi’s and screen sizes. The XML contains path and group objects. Each path contains the geometry of the object’s outline and group contains details for the object’s transformation. We use them in Android by implementing the Drawable class and the Vector.Drawable library.

5). Define the following:

1. Content Resolver - The object a client app uses to communicate with the content provider in another app.
2. Primary Key - A unique key that identifies a record in a database table.
3. Foreign Key - A field in the table that is a primary key in another table.
4. Relational Database - Before relational databases became common, information was typically stored in long text files, and each line contained all the fields for an entire element. This made it very difficult to search for specific information or to generate reports about specific fields. Enter relational databases. We introduce a set of tables from which data can be efficiently stored according to their properties and accessed and reassembled in many ways without having to recreate the entire database from scratch or spend unnecessary time searching. What makes it truly relational is that each table contains “keys”, which are uniquely defined fields which allows that table to be accessed by other tables.
5. Dangerous Permissions - Get permission from user before accessing any sensitive data/action like turning on camera or seeing contacts. You are required to implement these at runtime.

6). What is ORM - Object Relational Mapping lets you query and manipulate data that’s stored in a database using object oriented means. We use a library written in an OOP language, eliminating all need for SQL.

7). First, you must update the table in your own content provider’s database using the ALTER TABLE table\_name ADD COLUMN keywords. Because onUpgrade() takes the old versions identifier and the new version’s identifier, we must use conditionals to see if an upgrade was made. Then, we tell onUpgrade() to communicate with the content resolver to alter it’s representation of the database based on the upgrades we made.

\*\*IN TRADTIONAL SQL\*\*:

In SQL, we would use an ALTER TABLE table\_name query to add, drop, or change the data type of a column without destroying and recreating the entire table. For example, if we have an employee table listing the name, age, and salary of employees, but now we wish to add a column displaying the hours worked, we can do:

ALTER TABLE Employee ADD hours INTEGER

This will successfully create a new column titled hours. Remember to use the update query to then add a value to that new column for each employee. For example, to update the hours for the first employee:

UPDATE Employee

SET hours = 8

WHERE EmployeeID = 1