Lab Answer Key: Module 5: Restoring SQL Server 2014 Databases

Lab: Restoring SQL Server Databases

Exercise 1: Restoring a Database Backup

Task 1: Prepare the Lab Environment

1. Ensure that the 20462C-MIA-DC and 20462C-MIA-SQL virtual machines are both running, and then log on to 20462C-MIA-SQL as **ADVENTUREWORKS\Student** with the password **Pa$$w0rd**.
2. In the D:\Labfiles\Lab05\Starter folder, right-click **Setup.cmd** file, and click **Run as administrator**.
3. Click **Yes** when prompted to confirm you want to run the command file, and wait for the script to finish.

Task 2: Determine the Cause of the Failure

1. Start SQL Server Management Studio and connect to the **MIA-SQL** database engine using Windows authentication.
2. In Object Explorer, expand **Databases**, and note that the **HumanResources** database is in a **Recovery Pending** state.
3. In SQL Server Management Studio, click **New Query** and execute the following Transact-SQL code to attempt to bring the database online.

```
ALTER DATABASE HumanResources SET ONLINE;
```

4. Note the error message that is displayed. The database cannot be brought online because the primary data file is lost.
5. View the contents of the M:\Data folder to verify that the **HumanResources.mdf** file is not present.

Task 3: Restore the HumanResources Database

1. In SQL Server Management Studio, in Object Explorer, right-click the **HumanResources** database, point to **Tasks**, point to **Restore**, and click **Database**.
2. In the **Restore Database – HumanResources** dialog box, note that the backup history for the database has been retained, and the most recent full backup is automatically selected.
3. In the **Script** drop-down list, click **New Query Editor Window**. Then click **OK**.
4. When the database has been restored successfully, click **OK**.
5. View the Transact-SQL code that was used to restore the database, noting that the full backup was restored from file 2 in the R:\Backups\HumanResources.bak backup media set.
6. In Object Explorer, verify that the **HumanResources** database is now recovered and ready to use.

Result: After this exercise, you should have restored the HumanResources database.

Exercise 2: Restoring Database, Differential, and Transaction Log Backups

Task 1: Determine the Cause of the Failure

1. In SQL Server Management Studio, in Object Explorer, under **Databases**, note that the **InternetSales** database is in a **Recovery Pending** state.

2. Click **New Query** and execute the following Transact-SQL code to attempt to bring the database online.

```
ALTER DATABASE InternetSales SET ONLINE;
```

3. Note the error message that is displayed. There is a problem with the primary data file.
4. View the contents of the M:\Data folder to verify that the **InternetSales.mdf** file is present. This file has become corrupt, and has rendered the database unusable.

Task 2: Perform a Tail-Log Backup

1. View the contents of the L:\Logs folder and verify that the **InternetSales_log.ldf** file is present.
2. In SQL Server Management Studio, click **New Query** and enter the following Transact-SQL code to back up the tail of the transaction log:

   ```
   USE master;

   BACKUP LOG InternetSales TO DISK = 'R:\Backups\IS-TailLog.bak'

   WITH NO_TRUNCATE;
   ```

3. Click **Execute**, and view the resulting message to verify that the backup is successful.

Task 3: Restore the InternetSales Database

1. In SQL Server Management Studio, in Object Explorer, right-click the **InternetSales** database, point to **Tasks**, point to **Restore**, and click **Database**.
2. In the **Restore Database – InternetSales** dialog box, note that only the tail-log backup is listed. The backup history for this database has been deleted.
3. In the **Restore Database – InternetSales** dialog box, in the **Source** section, elect **Device** and click the ellipses (**...**) button.

4. In the **Select backup devices** dialog box click **Add**, and then in the **Locate backup File – MIA-SQL** dialog box, select R:\Backups\InternetSales.bak and click **OK**.
5. In the **Select backup devices** dialog box, ensure that **R:\Backups\InternetSales.bak** is listed, and then click **Add**.
6. In the **Locate backup File – MIA-SQL** dialog box, select R:\Backups\IS-TailLog.bak and click **OK**.
7. In the **Select backup devices** dialog box, ensure that both **R:\Backups\InternetSales.bak** and **R:\Backups\IS-TailLog.bak** are listed and click **OK**.
8. Note that the backup media contains a full backup, a differential backup, and a transaction log backup (these are the planned backups in **InternetSales.bak**); and a copy-only transaction log backup (which is the tail-log backup in **IS-TailLog.bak**). All of these are automatically selected in the **Restore** column.
9. On the **Options** page, ensure that the **Recovery state** is set to RESTORE WITH RECOVERY.
10. In the **Script** drop-down list, click **New Query Editor Window**. Then click **OK**.
11. When the database has been restored successfully, click **OK**.
12. View the Transact-SQL code that was used to restore the database, noting that the full backup, the differential backup, and the first transaction log backup were restored using the NORECOVERY option. The restore operation for the tail-log backup used the default RECOVERY option to recover the database.
13. In Object Explorer, verify that the **InternetSales** database is now recovered and ready to use.

Result: After this exercise, you should have restored the InternetSales database.

Exercise 3: Performing a Piecemeal Restore

Task 1: Begin a Piecemeal Restore

1. In SQL Server Management Studio, in Object Explorer, under **Databases**, verify that the **AWDataWarehouse** database is not listed.

2. Click **New Query** and enter the following Transact-SQL code start a partial restore of the database from the full backup set in position 1 in the **AWDataWarehouse_Read-Write.bak** media set:

   ```
   USE master;

   RESTORE DATABASE AWDataWarehouse FILEGROUP='Current'

   FROM DISK = 'R:\Backups\AWDataWarehouse_Read-Write.bak'

   WITH PARTIAL, FILE = 1, NORECOVERY;
   ```

3. Click **Execute**, and view the resulting message to verify that the restore is successful.

4. In Object Explorer, right-click the **Databases** folder and click **Refresh**; and verify that **AWDataWarehouse** is listed with a "Restoring" status.

Task 2: Restore Read/Write Filegroups and Bring the Database Online

1. In SQL Server Management Studio, under the existing code in the query pane, enter the following Transact-SQL code restore the differential backup set in position 2 in the **AWDataWarehouse_Read-Write.bak** media set:

   ```
   RESTORE DATABASE AWDataWarehouse

   FROM DISK = 'R:\Backups\AWDataWarehouse_Read-Write.bak'

   WITH FILE = 2, RECOVERY;
   ```

2. Select the code you just entered and click **Execute**, and view the resulting message to verify that the restore is successful.

3. In Object Explorer, right-click the **Databases** folder and click **Refresh**; and verify that **AWDataWarehouse** is now shown as online.

4. Expand the **AWDataWarehouse** database and its **Tables** folder. Then right-click **dbo.FactInternetSales** and click **Select Top 1000 Rows**. Note that you can retrieve data

from this table, which is stored in the read/write **Current** filegroup.

5. In Object Explorer, right-click **dbo.FactInternetSalesArchive** and click **Select Top 1000 Rows**. Note that you cannot retrieve data from this table, which is stored in the read-only **Archive** filegroup.

Task 3: Restore the Read-Only Filegroup

1. In SQL Server Management Studio, switch to the query window containing the RESTORE statements you entered earlier. Then add the following Transact-SQL under the existing code:

```
RESTORE DATABASE AWDataWarehouse FILEGROUP='Archive'
FROM DISK = 'R:\Backups\AWDataWarehouse_Read-Only.bak'
WITH RECOVERY;
```

2. Select the code you just entered and click **Execute**, and view the resulting message to verify that the restore is successful.

3. In Object Explorer, right-click **dbo.FactInternetSalesArchive** and click **Select Top 1000 Rows**. Note that you can now retrieve data from this table, which is stored in the read-only **Archive** filegroup.

Result: After this exercise, you will have restored the AWDataWarehouse database.