70-461 Exam Guide Querying Microsoft SQL Server 2012

If you are looking for preparation materials for 70-461 exam querying Microsoft SQL Server 2012 than hopefully you will find this blog posts useful.

You will see links that will point you directly to the area you want to study and you will see both our website links and comprehensive Microsoft documentation links.

If you are new to SQL we suggest to start with our SQL Tutorial first.

You can test your SQL Knowledge using our SQL Telephone Interview Questions. NOTE: These are interview questions NOT 70-461 exam questions so they may not represent exam topics.

Create Database Objects (24%)

- Create and alter tables using T-SQL syntax (simple statements).
  - This objective may include but is not limited to:
    - Create tables without using the built-in tools;

<table>
<thead>
<tr>
<th>Database Object</th>
<th>Our Links:</th>
<th>Microsoft Links:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE TABLE</td>
<td>SQL CREATE TABLE - Find out how to use CREATE TABLE. We start with very simple example and add extra options one step at a time.</td>
<td><a href="http://msdn.microsoft.com/en-us/library/ms174979(v=sql.110).aspx">http://msdn.microsoft.com/en-us/library/ms174979(v=sql.110).aspx</a></td>
</tr>
<tr>
<td>DROP TABLE</td>
<td>SQL DROP TABLE - Short and easy to follow blog post that show how to remove table using SSMS Interface and SQL DROP TABLE Statement.</td>
<td><a href="http://msdn.microsoft.com/en-us/library/ms173790(v=sql.110).aspx">http://msdn.microsoft.com/en-us/library/ms173790(v=sql.110).aspx</a></td>
</tr>
<tr>
<td>ALTER TABLE</td>
<td>Microsoft Links:</td>
<td></td>
</tr>
<tr>
<td>ALTER COLUMN</td>
<td>SQL ALTER TABLE ADD COLUMN</td>
<td></td>
</tr>
<tr>
<td>Microsoft links:</td>
<td>See Alter table above</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------</td>
<td></td>
</tr>
</tbody>
</table>

- Create and alter views (simple statements).
  - This objective may include but is not limited to:
    - create views without using the built-in tools

<table>
<thead>
<tr>
<th>CREATE VIEW</th>
<th>Microsoft links:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ALTER VIEW</th>
<th>Microsoft links:</th>
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<table>
<thead>
<tr>
<th>DROP VIEW</th>
<th>Our Links:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>SQL DROP VIEW - Short and easy to follow blog post that show how to remove view using SSMS Interface and SQL DROP TABLE Statement. Microsoft links:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Create indexed views</th>
<th>Microsoft links:</th>
</tr>
</thead>
</table>

- Design views.
  - This objective may include but is not limited to:

<table>
<thead>
<tr>
<th>I need to decode the exact requirement..... Many thanks to Cameron for decoding this requirement and here is decoded message with answers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Ensure that a legacy, non-recompiled application (which accesses a database;OLTP) is not broken (becomes unusable) because table schema (such as data types which might have been upgraded in SQL Server 2012) is changed. This is accomplished by creating/modifying Views, Stored Procedures, and Functions to emulate the</td>
</tr>
</tbody>
</table>
interface (signature) which the applications expects (to work successfully).

So if tables, their columns, data types, constraints, etc. have been changed/updated, instead of doing what lazy programmers hate most (upgrading their applications), business continuity is ensured via the easier task of creating/modifying views to emulate (mimic) the data structure expected by the application (code)."

Microsoft link:


<table>
<thead>
<tr>
<th>security implications</th>
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</thead>
<tbody>
<tr>
<td>- Create and modify constraints (simple statements).</td>
</tr>
<tr>
<td>- This objective may include but is not limited to:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>create constraints on tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Links: SQL CHECK Constraint - Find out how to restrict user values and ensure only good quality data is entered that meets business rules. Microsoft links: <a href="http://msdn.microsoft.com/en-us/library/ms188066(v=sql.110).aspx">http://msdn.microsoft.com/en-us/library/ms188066(v=sql.110).aspx</a></td>
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</table>

<table>
<thead>
<tr>
<th>define constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft links: See above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unique constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Links: SQL UNIQUE Constraint - Find out how to create UNIQUE Constraint and check two popular examples. Microsoft links: See above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>default constraints</th>
</tr>
</thead>
</table>
| Our links:
<table>
<thead>
<tr>
<th>SQL DEFAULT CONSTRAINT</th>
<th>Find out how to provide default value during insert when not value is provided for the specified field.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft links:</td>
<td>See above</td>
</tr>
</tbody>
</table>

| Our Links:             | SQL Primary Key Constraint - Find out how to add primary key using alter table statement.           |
|                        | SQL Foreign Key Constraint - Find out how to add foreign key constraint using alter table statement. |
| Microsoft links:       | See above                                                                                       |

**primary and foreign key constraints**

- Create and alter DML triggers.
  - This objective may include but is not limited to:
    - inserted and deleted tables;
      - Microsoft links:
    - nested triggers;
      - Microsoft links:
    - types of triggers;
      - Microsoft links:
    - update functions;
    - handle multiple rows in a session;
    - performance implications of triggers

**Work with Data (27%)**
- Query data by using SELECT statements.
  - This objective may include but is not limited to:
| Use the ranking function to select top(X) rows for multiple categories in a single query; | Microsoft links:  
| Write and perform queries efficiently using the new code items such as synonyms and joins (except, intersect); | Our links:  
SQL Except  
Microsoft links:  
| Implement logic which uses dynamic SQL and system metadata | |
| Write efficient, technically complex SQL queries, including all types of joins versus the use of derived tables; | |
| Determine what code may or may not execute based on the tables provided; | |
| Given a table with constraints, determine which statement set would load a table; | |
| Use and understand different data access technologies; | |
| CASE versus ISNULL versus COALESCE | |

- Implement sub-queries.
  - This objective may include but is not limited to:
    1. Identify problematic elements in query plans;
    2. Pivot and unpivot;
    3. Apply operator;
    4. CTE statement;
    5. With statement

- Implement data types.
  - This objective may include but is not limited to:
    1. Use appropriate data;
understand the uses and limitations of each data type: SQL Server 2012 Data Types - Data Type is a very important concept in SQL Server and we in this article you give you overview of data types and show key information related to them.

Impact of GUID (newid, newsequentialid) on database performance, QUICK ANSWER: newID is slower than newsequentialid. Articles to cover it will be included later on. QUICK ANSWER: newsequentialid is not entirely secure and you may guess the value...NewID is random and better for "randomization" (get truly random exactly 20 rows)
Microsoft links:

When to use which data type for columns
- Implement aggregate queries.
  - This objective may include but is not limited to:
    - new analytic functions;
    - grouping sets;
    - spatial aggregates;
    - apply ranking functions

- Query and manage XML data.
  - This objective may include but is not limited to:
    - understand XML datatypes and their schemas and interoperability with limitations and restrictions;
    - implement XML schemas and handling of XML data;
    - how to handle XML data in SQL Server and when and when not to use it, including XML namespaces;
    - import and export XML;

Microsoft links:
### Modify Data (24%)

- Create and alter stored procedures (simple statements).
  - This objective may include but is not limited to:
    - Our own requirements:
      - Create, Alter and Drop stored procedure
      - **Our Links:**
        - SQL DROP STORED PROCEDURE - In this tutorial you will learn how to drop procedure (remove from database) using both interface and script.
        - Microsoft links:
    - write a stored procedure to meet a given set of requirements;
      - **Microsoft links:**
    - branching logic;
      - **Microsoft links:**
    - create stored procedures and other programmatic objects;
      - **Microsoft links:**
    - techniques for developing stored procedures;
      - **QUICK ANSWER:** User-defined SP, Extended SP (Do not use; replaced with CLR) and system SP. Write article.
    - different types of stored procedure results;
      - **create a stored procedure for data access layer;**
        - **program stored procedures, triggers, and functions with T-SQL**
  - Modify data by using INSERT, UPDATE, and DELETE statements.
This objective may include but is not limited to:

| given a set of code with defaults, constraints, and triggers, determine the output of a set of DDL; | Microsoft links:  
| know which SQL statements are best to solve common requirements; | ?? |
| use output statement | Microsoft links:  

- Combine datasets.
  - This objective may include but is not limited to:

| difference between UNION and UNION all; | Microsoft links:  
| case vs. isnull vs. coalesce; | Microsoft links:  

- Work with functions.
  - This objective may include but is not limited to:

| Our own requirements:  
How to create, alter and drop functions | Our Links:  
**SQL DROP FUNCTION** - Find out how to remove function (drop) from database using both interface and script. |
| understand deterministic and non-deterministic functions; | Microsoft links:  
<table>
<thead>
<tr>
<th>scalar and table values;</th>
<th>Microsoft links:</th>
</tr>
</thead>
<tbody>
<tr>
<td>create and alter user-defined functions (UDFs)</td>
<td><a href="http://msdn.microsoft.com/en-us/library/ms186967(v=sql.110).aspx">http://msdn.microsoft.com/en-us/library/ms186967(v=sql.110).aspx</a></td>
</tr>
</tbody>
</table>

**Troubleshoot and Optimize Queries (25%)**

- **Optimize queries.**
  - This objective may include but is not limited to:
    - understand statistics;
      - Microsoft links:
    - read query plans;
    - plan guides;
    - DMVs;
      - Microsoft links:
    - hints;
      - Microsoft links:
    - statistics IO;
      - Microsoft links:
    - dynamic vs. parameterized queries;
    - describe the different join types (HASH, MERGE, LOOP) and describe the scenarios in which they would be used

- **Manage transactions.**
  - This objective may include but is not limited to:
    - mark a transaction;
      - Microsoft links:
    - understand begin tran, commit, and rollback;
      - Microsoft links:
<table>
<thead>
<tr>
<th>Topic</th>
<th>Microsoft links</th>
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</thead>
</table>

- Evaluate the use of row-based operations vs. set-based operations.
  - This objective may include but is not limited to:
    - when to use cursors;
    - impact of scalar UDFs;
    - combine multiple DML operations

- Implement error handling.
  - This objective may include but is not limited to:
    - implement try/catch/throw;
    - use set based rather than row based logic;

Microsoft links:

Take care

Katie & Emil