**Second T-SQL Analytics Assignment**

The purpose of this assignment is to provide another example of the process of understanding the analytics problem, envisioning the dataset solutions, designing the T-SQL query, examining the resultset, transfer of resultset to Excel and creation of beautiful tables and charts. Here repetition is also used to build speed.

The same solution process is used, marketing problem recognition, mental visualization (or paper and pencil sketching) of the desired solution (the data set), conceptual design of the T-SQL syntax, execution of T-SQL code until desired results are available, data visualization (here using Excel, the next assignment using SSRS), copy of tables and graphs to a word processing document, and textual write-up of the findings. The most important process task is to carefully interpret the results (perhaps after using additional graphs) and write some thoughtful and insightful analysis and offer some suggestions.

Analysts are called in to meetings and hear about all sorts of problems’ that need to be fixed. While managers have the fiscal power to apply resources need to solve problems, they like to make informed decisions. You the analyst need to listen to the problems and help decide the information that is needed to better understand the problem to allow optimal decision choice. Managers therefore will ask for different types of information, and different data visualizations that explain causes behind the problems, etc. Your job as an analyst is to display empathy, remember you are on the same team as the managers (therefore having the same goals) and then magic needs to occur.

Just as the manager envisions the future and improved business operations and performance, you the analyst need to envision the reports and visualizations that are needed to solve the problems. You need to listen to the problems and the team’s intended directions and goals, and envision the decision criteria that can solve the problem. Then produce amazing visualizations and insights. The process is not clean or simple and if you do not have much empathy as an enduring character trait, then perhaps do not become a business analyst, stick to other development work that has little human interaction.

Please notice that the process of listening and reading between the lines and conjuring up innovative (non-scripted) reports and dashboards is a design process and conceptual exercise that is at a much higher level of sophistication that of the Jr. level report writer whom is told EXACTLY what outputs and reports are needed. act as Your job as an analyst is to understand and answer the unspoken question. Managers and other leaders are usually time harried and working on a dozen projects, and solving hundreds of problems per week. So there is never time for the manager to tell the analyst EXACTLY what report or dashboard they need, or the EXACT KPI that is needed to look into the problem at hand. Often managers can just enunciate something about the problem, and they may have a rudimentary idea of what information they need, but not a detailed idea. Many problems are new and solution processes have not been routinized yet. The requester may not fully understand the problem themselves. So as budding business analysts it’s time to exercise your critical thinking and problem solving skills, reach into the data, and envision solutions. In this assignment after some warm-up analysis, the last question gives you the opportunity to be creative in your solution design.  
  
TSQL is very powerful. There are procedures that can be performed in T-SQL that Excel cannot handle, nor can Excel handle a terabyte of data either. Due to its ability to afford you mastery over your data, T-SQL must be covered in the course. If this content is difficult and tedious a) it gets easier, b) there are much easier parts of the course coming.

Again this second project that covers intro T-SQL analysis is used to concretize this module’s contents. Before we move onto the next topic, let’s gain confidence and speed.

**Part 1**  
  
Perform an analysis on the Internet sales channel. More specifically, perform and analysis of the total # units sold, and the total revenue generated for the Territories of the United States (there are 5 sales territories in the United States; Northeast, Northwest, Southeast, Southwest and Central). Filter the results for the year 2007. Use Datepart() to group the sales by month (sorting so that the data starts with month 1 and ends with month 12). Copy the data in Excel (You should have 60 rows [12 months x 5 territories], and 4 columns of data).

To get you started – you are given this sample query. Go ahead and run it and add the sorting. Experiment with the query by changing the WHERE filter statements to select different countries that you see in the dimSalesTerritory table and different time periods. After referring to the T-SQL Primer document, you can also change the date to week to look at the data differently if you wish.

USE [AdventureWorksDW2012];

SELECT [SalesTerritoryRegion], DATEPART(Month, [OrderDate]) as [Month]

, SUM([OrderQuantity]) AS [Total Sold]

, SUM([SalesAmount]) AS [Total Revenue]

FROM [dbo].[FactInternetSales] as s

INNER JOIN [dbo].[DimSalesTerritory] as t

ON s.[SalesTerritoryKey] = t.[SalesTerritoryKey]

WHERE [SalesTerritoryCountry] = 'United States' AND YEAR([OrderDate]) = 2007

GROUP BY [SalesTerritoryRegion], DATEPART(Month, [OrderDate])

ORDER BY [SalesTerritoryRegion], [Month]

Draw two line charts   
  
a) The first line chart should chart total units sold over the time period   
b) The second line chart should chart total revenue over the time period  
  
Write a paragraph of analysis that describes your findings, the trends over time and recommendations.

**Part 2 -** Modify the provided base query, perform the same analysis for the sales territory regions that are NOT in the United States. Again analyze the sales grouped by months for 2007, and provide 2 line charts. Again write a paragraph of analysis that describes your findings, the trends over time and recommendations.

**Part 3 –** Now we will modify the provided base query changing the fields in the select statement and in the group by statement. Before we start here is some background information from the DBA to assist you. You can run these queries to replicate the results and get more familiar with the data.

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| Notice below that there is a hierarchy in the data regions within Countries within Groups. Depending on the usage of group, country or region (or combination of them) in the SELECT, GROUP BY and ORDER BY phrases; you will be calculating different totals. | |
| USE [AdventureWorksDW2012];  SELECT [SalesTerritoryGroup]  , [SalesTerritoryCountry], [SalesTerritoryRegion]  FROM [dbo].[DimSalesTerritory]  ORDER BY [SalesTerritoryGroup]  , [SalesTerritoryCountry], [SalesTerritoryRegion] |  |
| Notice below that another hierarchy exists: product within model within product sub-category within product category. There are >500 products within <400 Models, within <40 sub-categories and within 4 categories. So for example there are many different color and sizes of the HL Mountain Frame.  Different terms in your SELECT and GROUP BY will reap different totals | |
| USE [AdventureWorksDW2012];  SELECT cat.EnglishProductCategoryName  As [Category]  , sub.EnglishProductSubcategoryName  AS [Sub-Category]  , p.ModelName AS [Model], p.EnglishProductName AS [Product]  FROM [dbo].[DimProduct] as p  INNER JOIN [dbo].[DimProductSubcategory] as sub ON p.ProductSubcategoryKey = sub.ProductSubcategoryKey  INNER JOIN [dbo].[DimProductCategory] as cat  ON sub.ProductCategoryKey = cat.ProductCategoryKey  ORDER BY cat.EnglishProductCategoryName  , sub.EnglishProductSubcategoryName, p.ModelName |  |

Modify the base query and report on the data after changing the grouping statement in three different manners (so you are writing 3 similar but different queries). Provide the same grouped measures (total of order quantity and total of sales amount:  
   
a) for each sub-category within the bikes category (mountain bikes, road bikes, tour bikes) for the different regions of the United States in 2007  
b) for each sub-category within the bikes category for each country (rather than region)  
c) modify b above and change the grouping from month to sales by week.  
  
Copy the data into Excel and create as many line or column charts that you think are necessary to explain the analysis. Write a paragraph or two of analysis that describes your findings, the trends over time and recommendations. Save the last query, we might use it in a later SSRS assignment.

**Part 4 –** Choose a different product category and perform some analysis of your own design to explain regional sales over time. Experiment with different groupings and ordering of the groupings. Draw two or three line charts that demonstrate your findings. Again add a paragraph of analysis and recommendations.

**Part 5 -** Cristiana the Marketing manager is again asking for more back ground information about sales of the ***road wheel products*** in the Reseller Network. Using datepart(), write a query and Excel line chart that shows the total sales in units for the reseller channel by month for the wheels. As you learned from the prior assignment there are three different models of road wheels – for example the rear-wheels have a LL model for $68, a ML model for $165, and a HL model for $214. You can examine the sales of the wheels in different ways (front wheel vs. rear wheel, or by product quality LL, ML, HL). Here is a hint:

WHERE sub.EnglishProductSubcategoryName = 'Wheels' AND p.ModelName LIKE '%Road%'

Add an excel chart or two and some commentary to explain your findings.

**Part 6 (optional) -** Write one addition query of similar or higher complexity. Explain your reasoning for including the analysis, and then explain the results and insights gained from the 1 or 2 charts. Again add a paragraph of analysis and recommendations.  
  
So build a report with a cover page and different sections. Add the Excel charts to each section, nicely formatted, with the analysis on top and the chart below. Better grades given to more professional work.