Introduction to Data Management and Analytics: Big Data and Small Data

Class Time: Monday and Wednesday 2:30 p.m. – 5:30 p.m.
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COURSE CATALOG DESCRIPTION:

Analysis of data is becoming a vital component of Business decision-making. As demands change from customers and environmental conditions businesses must be able to quickly react to these changes. The important factors in business decision-making is managing data in a relational database system and turning that data into information after it has been processed to add context, reliance and purpose.

This course uses case studies to review the data challenges business confront and how data management and analytics is used to help make sound management decisions. There are two major components dealing with data. One is data integration and management. This requires an understanding of Relational Database Management Systems, ie. SQL Server, Oracle, DB2, MySQL, etc. and how they are designed for data manipulation, maintenance and storage. The second is data Analytics. This is the process of examining the data to generate information to draw conclusions. These conclusions are made possible by using the various analytic tools currently available, i.e. MS Power Business Intelligence(BI), Hadoop, Tableau, Excel, SAS, etc.
**Course Objectives:**

- To gain an understanding of Relational Database Management Systems
- To gain an understanding and use Structured Query Language
- To gain an understanding of Data Analytics and Visualization
- To gain an understanding of how managers use analytics to formulate and solve business problems and to support managerial decision making.

**Course Topics:**

- Understanding Relational Database Management Systems;
- The database Normalization process;
- Implementation of Referential Integrity;
- Using SQL Data Manipulation Language (DML): Used to retrieve, update and delete contents of a database;
- Using SQL Data Definition Language (DDL): Used to create database objects such as tables, stored procedures, cursors, indexes, etc.
- Using SQL Queries: Using SQL syntax to execute queries; and getting and using data result sets;
- Understand summary statistics of a data set, including sizes, ranges and variations.
- Interpret the business significance of the data, what it implies about the business, customers, etc.
- Generating reports on the data, including appropriately constructed graphics and histograms that illustrate important features of the data.
REQUIRED READINGS:

Optional Course Text(s):

Business Intelligence Guidebook - From Data Integration to Analytics
First Edition
Rick Sherman
Morgan Kaufmann; 1 edition (November 21, 2014), 550 pages

Course Material:

Handouts: To be assigned during class

Files: To be assigned during class

Software:

Microsoft SQL Server 2014 (Free)
Microsoft Power BI Desktop (Free)
Final Project:

The students will demonstrate their work in front of the class as part of the final submission of their final project. They should describe the problem that they were trying to solve (or the hypothesis of their work) as well as the steps they took to analyze the data. They should report on the models that were built and their veracity or quality. The demonstration should focus particularly on the end product - a report, application, or visualization that shows a data product or analysis in action.

Students should also submit a final project that discusses the following:

- A one paragraph abstract describing the project
- The problem or hypothesis being solved
- Applications or motivation for a good result
- The steps taken to perform the analysis (ingestion, wrangling, computation, and visualization).
- A discussion of the methodology used, its quality and if it could be improved
- A discussion of the final product (application, report, or visualization)
- A conclusion that contains lessons learned

Please ensure that you cite all sources in your final project.
GRADING:

Class Participation        10%
Test/Quiz/Assignments      50%
Project:                    40%
Total:                      100%

The Grading Scale

A : 900 - 1000
B : 800 - 899
C : 700 - 799
D : 600 - 699
F : 599 and below
<table>
<thead>
<tr>
<th>Week</th>
<th>Subject</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Overview Relational Database Management Systems: Database, Conceptual schema, relational database design, normalization</td>
<td>Exercises Module 1</td>
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<td>Week 2</td>
<td>Understanding Core Database Objects: Creating database objects</td>
<td>Exercises Module 2</td>
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<td>Week 3</td>
<td>Understand the foundations of Structured Query Language: querying, table relationships and Joins</td>
<td>Exercises Module 3</td>
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<td>Week 4</td>
<td>Overview Business Intelligence and Analytics</td>
<td>Exercises Module 4</td>
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<td>Week 5</td>
<td>Descriptive Analytics: Data Visualization and Exploration</td>
<td>Exercises Module 5</td>
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<td>Week 6</td>
<td>Data Query, Data Model and Reports</td>
<td>Exercises Module 6 Final Project Presentations</td>
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