

Using Data Analytics Software in the Classroom

Presented by:

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Agenda:

- Projects by Course
 - Graduate Course
 - Undergraduate Course
- Lessons Learned
- Contact Information

Graduate Course – Data Analytics

- Course: Data Analytics for Accountants
- Degree Program: Masters of Science in Accounting
- Software utilized: Excel & IDEA (Computer Assisted Audit Tools)

Graduate Course – Data Analytics

Case #1: Students were provided with purchasing data, including individual purchase transactions and a supplier master file

Software: Excel

Objective: To look for trends, anomalies, and other potential internal control weaknesses in the data set by creating 10 questions that can be answered by the data.

Graduate Course – Data Analytics

Case #1 (Continued)

Required Deliverables: Answers to the 10 questions as well as recommendations to Management based upon findings.

Skills Utilized: Descriptive analytics, knowledge of purchasing transactions, knowledge of database relationships

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Case #1 (Continued)

Student Questions:

- Trending of prices for items purchased
- Suppliers that were utilized most often for purchases
- Sequence of dates when purchases were made
- How many items were typically purchased on one purchase order

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Case #1 (Continued)

Student Recommendations:

- Suppliers that had the lowest price for the same products
- How to achieve efficiencies with placing orders
 - Consolidate orders, place orders on certain days of the week
- Which suppliers to discontinue relationships with due to lack of purchasing activity

Graduate Course – Data Analytics

Case #2: Students were provided with sales data, including individual sale transactions, a sales representative listing, and a customer master file

Software: IDEA

Objective: To find solutions to the 4 objectives provided

Graduate Course – Data Analytics

Case #2 (Continued)

Objectives:

- 1) To determine if the 'Amount' and 'Total Sale' fields have been correctly calculated
- 2) To determine total sales by month and by payment type
- 3) To summarize all sales made by state by quarter
- 4) To determine the amount of revenue used in paying commission to each individual employee

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The screenshot displays a data analytics application interface. At the top is a menu bar with 'File', 'Home', 'Data', 'Analysis', 'View', 'Macros', and 'SmartAnalyzer'. Below this is a ribbon with various tool groups: 'Tasks' (Direct, Top Records, Gap Detection, Duplicate Key, Re-run, Indexed, Key Value), 'Extract', 'Explore' (Benford's Law, Statistics, Summarization, Aging, Stratification, Pivot Table, Chart), 'Categorize', 'Relate' (Join, Visual Connector, Append, Compare), 'Sample' (Attribute, Monetary Unit, Random, Variables, Other), and 'Visualization' (Discover, Visualize).

On the left is a 'File Explorer' showing a tree view of a project named 'esktop Project'. It lists several tables: 'Customer master' (245 records), 'Sales Reps' (28 records), 'Sales Transaction...' (989 records), 'Sales Trans wi...' (989 records), and 'Sales Tran...' (989 records).

The central area shows a data table titled 'Sales Trans with Cust and Sales Rep'. The table has 12 rows and 11 columns: INV_NO, INV_DATE, SALESREP, CUSTOMER_NO, PROD_CODE, PMT_TYPE, QTY, UNIT_PRICE, AMOUNT, and SALES_TAX. The data represents individual sales transactions with their respective dates, sales representatives, customer numbers, product codes, payment types, quantities, unit prices, total amounts, and sales taxes.

On the right is a 'Properties' panel with sections for 'Database', 'Results', and 'Indices'. The 'Database' section is expanded, showing 'Data' (checked), 'History', 'Field Statistics', 'Control Total', and 'Criteria'.


	INV_NO	INV_DATE	SALESREP	CUSTOMER_NO	PROD_CODE	PMT_TYPE	QTY	UNIT_PRICE	AMOUNT	SALES_TAX
1	1000591	8/21/2015	104	10000	03	1	5	37.28	186.40	18.64
2	1000584	8/21/2015	104	10003	05	1	1058	7.14	7,554.12	755.42
3	1000429	7/10/2015	104	10004	05	1	700	6.31	4,417.00	441.70
4	1000271	5/9/2015	104	10005	05	1	1000	7.51	7,510.00	751.00
5	1000820	10/31/2015	104	10005	05	1	1000	7.51	7,510.00	751.00
6	1000131	3/7/2015	104	10006	05	2	2050	7.86	16,113.00	1,611.30
7	1000144	3/9/2015	104	10006	05	1	2050	7.86	12,279.50	1,227.95
8	1000309	6/6/2015	104	10101	05	1	210	6.58	1,381.80	138.18
9	1000341	6/20/2015	104	10101	05	1	210	6.58	1,381.80	138.18
10	1000960	12/3/2015	104	10101	05	1	210	6.58	1,381.80	138.18
11	1000040	2/1/2015	104	10102	05	1	107	6.41	685.87	68.59
12	1000640	9/4/2015	104	10102	05	1	177	6.50	1,150.50	115.05

Graduate Course – Data Analytics

Case #2 (Continued)

Required Deliverables: Solutions to the 4 objectives documented in an audit program, including detailed procedures and any IDEA scripts utilized to obtain the answer

IDEA Case #1
Audit Program

Applicable to:	Test Step Objective	Files Used	Total Number of Records	Detailed IDEA Procedures	IDEA Equation (if using the Equation Editor)	Test Results
<i>Example:</i>						
Sales by Zip Code	To determine what the total sales are by customer zip code for the entire population	Sales Transactions, Customer Master	1234	<ol style="list-style-type: none"> 1. Obtained the following data files for the year: Sales Transactions, Customer Master file 2. Import the data files listed above into IDEA 3. Verify that the data files match the number of records, as provided in the instructions 4. Open the Sales Transactions database and select 'Join' with the Customer Master file as the secondary database. For the primary database, keep all fields selected. For the secondary database, only select 'Zip' as the field. Use 'CustNo' as the match field. For output, select 'All records in the primary file'. Rename the database 'Sales with Zip'. 5. Using the 'Sales with Zip' database, select the Summarization option with the following options: summarize based on zip code, select the recalculated amount, tax, and total amount as the numerical fields to total. Name the summarization 'Totals by Zip'. 	N/A to this test	<p>Export the results from the data file into Excel (Home, Export, Microsoft Excel 2007-2010). All files are saved to the following path on the C drive:</p> <p>C:\Users\metzger\Documents\My IDEA Documents\IDEA Projects\Project Name\Exports. Then insert the Excel file into the Test Results column (Insert, Object, Create from File, Browse (find the file you want to attach), and then select 'Display as an Icon'. Make sure that this file can be open and is the correct file prior to submission.</p> 

Graduate Course – Data Analytics

Case #2 (Continued)

Skills Utilized: Descriptive analytics, script writing, knowledge of sales transactions, knowledge of database relationships

Undergraduate Course – Data Analytics

- Course: Accounting Information Systems
- Degree Program: Bachelors of Science in Accounting
- Software utilized: IDEA (Computer Assisted Audit Tools)

Undergraduate Course – Data Analytics

Project #1: Students were provided with payroll data, including payroll transactions and an employee master file

Software: IDEA

Objective: To answer 10 questions posed about the data set (various versions created to minimize the potential for cheating)

Undergraduate Course – Data Analytics

Questions:

1. What is the total of the 'Salary' field for employees within the 'Operations' department?
2. Which department has the highest average salary?
3. Are there any duplicate employee numbers (EMPNO)? If so, please include all employees that match in the exported file. Do not use the comprehensive database for this question; rather, use the 'Payroll Master Records' and 'July Pay Records' files – and merge the results.
4. Extract all records that meet the following criteria: Sum of Taxes is \$0 and Sum of Gross is greater than \$0.
5. What employees received pay in July that were not included in the Payroll Master file?
6. What employees received 'gross' pay in excess of \$5,000?
7. Recalculate 'Net pay' by taking 'Gross' minus 'Taxes', 'Insurance', 'Credit Union', plus 'Overtime'. Then calculate if any differences occurred based upon your recalculated 'Net pay' vs. the one included in the original data file. Extract all employees with an inaccurate net pay per your recalculation.
8. From the employees extracted in Q7, perform another extraction of employees that had a net pay difference of greater than \$1.00.
9. For each grade level, what is the maximum 'Salary' amount?
10. What employees have the same value in the 'Name' field?

Undergraduate Course – Data Analytics

Project #1 (Continued)

Required Deliverables: Exported Excel files answering the 10 questions

Skills Utilized: Descriptive analytics, knowledge of payroll transactions, knowledge of database relationships, and basic scripting

Lessons Learned:

Graduate Course

- Challenging to grade:
 - When each student was allowed to create their own questions (10 questions * 65 students)
 - The data sets generally have built in errors which may cause the analysis to be affected
 - Difficult to create a 'solution' and may need to accept more than one answer

Lessons Learned:

Graduate Course

- Difficult to teach analytical thinking; easier to teach the software/technology utilized
- Initially I allowed the students to create their own questions
- Going forward, I will have the class come up with unified questions together to minimize the impact on grading

Lessons Learned:

Undergraduate Course

- Students need to have a firm understanding of database methodologies prior to this project
- Directions needed to be more detailed
- Questions need to be straight forward
- Multiple versions made (10 in total) to minimize the potential for cheating

Contact Information:

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