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Business Intelligence Illustrated Using Crime Data as an Instructional Tool

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Abstract

In the Management Information Systems classroom, faculty are encouraged to provide a student focused learning environment that focuses on utilizing business and industry practices as tools. Examples should incorporate concepts which students can readily comprehend. The City of Houston Uniform Crime Report Statistics spreadsheet and database data is being utilized in a College of Business MIS program. In this paper, examples will be described which provide illustrations showing how this ever-changing Crime Report data provides an instructional landscape that students can readily recognize, and which can also be used as a tool that reinforces learning. Varying examples, utilizing business and industry practices, will be shown. As examples, crime data will be shown to demonstrate concepts in an assortment of courses taught in the MIS discipline such as the Management of Information Systems course, Microcomputer Applications course, Introduction to Database course, and the Business Intelligence course.

Introduction

Do your students often find it difficult to grasp a technical concept because they have difficulty understanding the example you are trying to share, or the idea does not pique their interest? Business Intelligence is one of those concepts. According to Brannon (2010), “Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions.” To describe this process, he explains how the data is aggregated using data sources, then transformed to meet some apparent business need, and, last, the information is analyzed using some tool which can analyze the data for reporting purposes. Business intelligence (BI) now has tools able to identify the interests of users and facilitate the analysis and dissemination of information and knowledge, according to Fourati-Jamoussi & Niamba, (2016). Different tools from several companies can be used for this purpose. The list of companies which have these analytical tools is numerous, but the list includes IBM, SAS, SAP, Information Builder, Oracle, Microsoft (Excel, PowerBI, Access, and others), Tableau and others. Gartner’s magic Quadrant for Business Intelligence and Analytics Platform consistently puts Microsoft, Tableau and Qlick in top right quadrant as the leading software BI software packages, with a new addition of ThoughtSpot’s in 2019. (Gartner Research, 2019)

Gartner's magic Quadrant for Business Intelligence and Analytics



As it relates to the academic environment, Wixom & Ariyachandra (2011) researched students and professors regarding the state of Business Intelligence in higher education. Comments from the professors included mention that: there should be “great initiative to promote this important topic within MIS curriculum” and “finding software that would allow students to apply BI concepts, learnt with minimal startup time for a faculty member, is still challenging”. Later, Kissi, Nat, and Ndwu (2017) conducted a study of graduate students regarding the relevance of integrating business intelligence into the business education curriculum and Wang & Wang (2019) described a teaching module using Microsoft Access and Microsoft Excel “because the Microsoft Office environment is commonly available and provides seamless connections between an Access database and ... analytical tools in Excel”.

Snow (2017) asked the questions “How reliable is my data? How do I present it in a manner that allows my team and leadership to make informed decisions? Does a trend exist that we can't see up front?” To answer this question, Snow (2017) cited Excel as a Business Intelligence tool which is in use by millions of users each and every day. In another case study described by Andronie (2016), different training courses were examined with Excel serving as the business intelligence tool being used to analyze the data. Asamoah, Sharda, Zadeh, & Kalgotra (2017) cited the need for “well-trained professionals to manage huge volumes of data, analyze the data and convert its output into some usable output”.

In the study by Wixom & Ariyachandra (2011), student comments included: “It would help to be shown real-world cases or see how companies use BI in every-day operations” and “The lack of BI case studies means that a number of cases used in class are out-of-date and seem less relevant in light of current practices and technology. Wixom & Ariyachandra (2011) However, as the use of BI is growing rapidly, more data is available from government and business sources for analysis.

Using Excel and Access to assist in illustrating the use of Business Intelligence tools in an instructional environment, can be difficult. Additionally, finding data that provides variety, while being interesting and informative, is often difficult. Studying and using real-world data, providing a reality-based education experience, much like that used in a real-world setting is a complaint student often bring up. Often, we have seen this occur. To avoid this problem, at one university, students are provided with data extracted from the City of Houston Uniform Crime Report Statistics. Svarrea & Gaardboea, (2018) described the use of Business Intelligence by the Danish government and how governments are using it to improve their decision-making processes.

This data is updated and publicly reported each month. This data is used to illustrate various spreadsheet and database concepts. Microsoft Office Excel and Access 2016 were used for all tables and figures.

Uniform Crime Report Statistics Data

The Uniform Crime Reporting (UCR) Program was conceived in 1929 by the International Association of Chiefs of Police to meet a need for reliable, uniform crime statistics for the nation. Later, the FBI was tasked with collecting, publishing, and archiving those statistics. Now they are submitted by nearly 17,000 local law enforcement agencies throughout the U.S. (Uniform Crime Reporting, 2018).

The information contained in the Uniform Crime Report data, provides a monthly listing of crimes on which Houston Police Department (HPD) police wrote police reports. The crime data reports on the following types of crime: murder, rape, robbery, aggravated assault, burglary, theft, auto theft. (City of Houston, 2017) The data is collected via a Transaction Processing System with input from various sources: 911 calls, input from data gleaned from other divisions within the HPD, input from the HPD terminals in vehicles, walk-ins and more. The Crime Data Source is shown in Figure 1. (City of Houston, 2017)

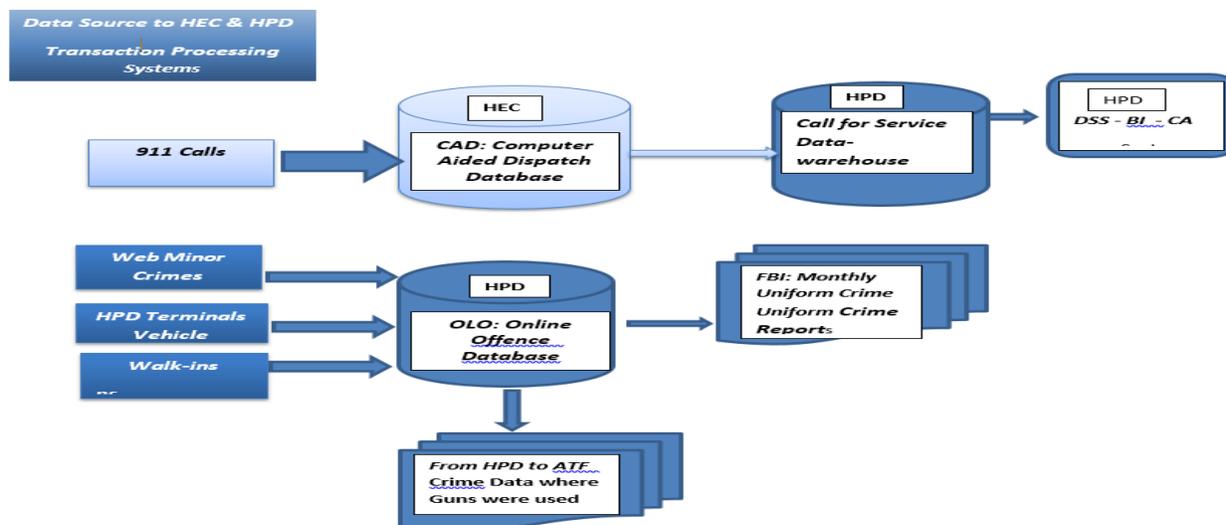


Figure 1: Crime Data Source and Data Flow

Per the Disclaimer information on the City of Houston website, the information reported in the crime data represents:

- *Information not yet verified by further investigation*
- *Information that may include mechanical or human error*
- *Preliminary crime classifications that may be changed at a later date based upon further investigation*
- *The information represents only police services where a report was made and does not include other calls for police service.*
- *The information does not reflect or certify "safe" or "unsafe" areas.*
- *Areas with a high volume of foot traffic, vehicle traffic, and if densely populated may have more reported crimes than other areas. This does not necessarily mean more crime occurs there, but that more crime is reported there.*
- *Results displayed are not distinguished as attempted or completed crimes.*
- *Users should not rely on nor make decisions or comparisons based solely on the data offered on this web site; but should conduct additional independent verification and due diligence.*
- *The information will sometimes reflect where the crime was reported versus where the crime occurred. (City of Houston, 2017)*

Data Files

The data descriptors provided in the crime data consist of the following:

- **Date** *The date of the crime report (this may or may not be date of actual crime)*
- **Hour** *The hour in 24-hour military-time format for the crime or the crime report*
- **Offense Type** *Description of the reported crime*

- Beat *HPD internal code designation of the police patrol area*
- Premise *Description of the location of the crime (house, apt. complex, business, etc.)*
- BlockRange *Approximate street block of the location for the crime or crime report*
- StreetName *Name of the street of the location for the crime or crime report*
- Type *Type of thoroughfare (St, Rd, Blvd, Ave, etc.)*
- Suffix *Any other designation for street such as N, S, E, W*
- #Offenses *Number of reported crimes on this report (City of Houston, 2017)*

Here is an example of what the EXCEL table data looks like:

Table 1: Sample Excel Table Spreadsheet

	A	B	C	D	E	F	G	H	I	J
1	Date	Hour	Offense Type	Beat	Premise	BlockRange	StreetName	Type	Suffix	Offenses
2	1/22/2017	12	Theft	10H10	Apartment	300-399	LIVE OAK	ST	N	1
3	1/23/2017	09	Theft	10H10	Residence or House	300-399	ENNIS	ST	N	1
4	1/24/2017	10	Theft	10H10	Apartment Parking Lot	2100-2199	CANAL	ST	-	1
5	1/24/2017	12	Theft	10H10	Apartment Parking Lot	2800-2899	CANAL	ST	-	1
6	1/24/2017	22	Theft	10H10	Apartment Parking Lot	2100-2199	RUNNELS	-	-	1
7	1/26/2017	17	Theft	10H10	Road, Street, or Sidewalk	400-499	LOCKWOOD	DR	S	1
8	1/27/2017	08	Burglary	10H10	Laundry, Dry Cleaners, Washaterias	2000-2099	RUNNELS	-	-	1
9	1/27/2017	19	Aggravated Assault	10H10	Road, Street, or Sidewalk	4400-4499	NAVIGATION	-	-	1
10	1/28/2017	15	Theft	10H10	Restaurant or Cafeteria Parking Lot	2800-2899	NAVIGATION	-	-	1
11	1/29/2017	21	Theft	10H10	Road, Street, or Sidewalk	2300-2399	COMMERCE	ST	-	1

The data is provided to the public in two formats: data in a spreadsheet in Microsoft Office Excel and in a database table format using Microsoft Office Access. For the purposes of this paper, Office 2016 was utilized. (Microsoft, 2018)

This is an example of the ACCESS database table structure (see Table 2) and sample data (see Table 3):

Table 2: Sample Access Table Structure

Field Name	Data Type
Date	Date/Time
Hour	Short Text
Offense Type	Short Text
Beat	Short Text
Premise	Short Text
BlockRange	Short Text
StreetName	Short Text
Type	Short Text
Suffix	Short Text
# offenses	Number

Table 3: Sample Access Table Records Listing

Date	Hour	Offense Typ	Beat	Premise	BlockRange	StreetName	Type	Suffix	# offenses
1/22/2017		Theft	10H10	Apartment	300-399	LIVE OAK	ST	N	1
1/23/2017	09	Theft	10H10	Residence or H	300-399	ENNIS	ST	N	1
1/24/2017	10	Theft	10H10	Apartment Par	2100-2199	CANAL	ST	-	1
1/24/2017	12	Theft	10H10	Apartment Par	2800-2899	CANAL	ST	-	1
1/24/2017	22	Theft	10H10	Apartment Par	2100-2199	RUNNELS	-	-	1
1/26/2017	17	Theft	10H10	Road, Street, o	400-499	LOCKWOOD	DR	S	1
1/27/2017	08	Burglary	10H10	Laundry, Dry Cl	2000-2099	RUNNELS	-	-	1
1/27/2017	19	Aggravated Ass	10H10	Road, Street, o	4400-4499	NAVIGATION	-	-	1
1/28/2017	15	Theft	10H10	Restaurant or C	2800-2899	NAVIGATION	-	-	1
1/29/2017	21	Theft	10H10	Road, Street, o	2300-2399	COMMERCE	ST	-	1
1/29/2017	22	Theft	10H10	Apartment Par	2100-2199	CANAL	ST	-	1

MIS Program Components

The Management Information Systems academic program is a part of a four-year 120-hour degree program at a state-supported public institution, housed in the College of Business. The MIS Program Components consist of the: University Common Core Required courses, Business Core Required courses, Required MIS Major courses, and MIS Elective courses.

The University Common Core Required Courses consist of 42 hours. The Foundational Component Common Core includes courses in areas such as: Communications, Math, Life and Physical Sciences, Language, Philosophy and Culture, Creative Arts, History, Government, Social and Behavioral Sciences, and more.

The Business Core Required Courses consist of 48 hours. These business core courses include courses such as accounting, marketing, economics, finance, Management of Information Systems and others.

The Required MIS Major Courses consist of 24 hours. The required courses are Systems Analysis and Design, Database Systems, Enterprise Architecture, Information Systems Infrastructure, Programming and Application Development (JAVA), Information Systems Project Management, Application Analysis, Design, & Implementation and Information Systems Strategy, Management & Acquisition.

To complete the degree, students are required to finish 6 hours of MIS Elective Courses. This list includes Business Productivity Software Tools/Microcomputer Applications, Designing and Developing Business Web Applications; Supply Chain Information and Control Systems,

Enterprise Systems using SAP, Business Analysis and Processes, Data Life Cycle and Management, Computer Control and Audit, Information Security Management, Business Intelligence, Special Topics and other approved elective selections.

The four course examples that this paper will focus on, are as follows: Management of Information Systems, Database Systems, Microcomputer Applications and Business Intelligence. This data may be used in any of these courses. The course descriptions for each of these courses follows.

Management of Information Systems Course

A survey course dealing with the managerial and technical environments within which computer information systems exist in business organizations. The student is introduced to a wide range of topics pertaining to the business use of information systems technology including systems development, computer operations, ethical and societal issues in information systems, and emerging technologies. (University of Houston Downtown, 2017)

Database Systems Course

This course introduces the development of computer-based systems to manage business data. The organizational context of database management, concepts of data modeling and database design are presented. Data file management, database administration issues, database implementation, data retrieval using query languages, database technologies and graphical user interface functions are introduced in this course. Career and specialties exploration related to managing data and information is also covered. (University of Houston Downtown, 2017)

Business Productivity Software Tools/Microcomputer Applications Course

This course explores beyond the introductory level the most common productivity software applications and some software development tools used in business. Productivity programs are tools that you can use to create documents, presentations, tables, charts, and graphs. In this course, students learn the advanced features of various productivity programs such as word processing software, spreadsheets, presentation software, and database management systems. Examples of topics are working with document collaboration and integration tools, defining and using macros within word processing and spreadsheet applications, administering a database system, and basic software development using a visual programming language. Students will also learn how to select the appropriate software to cater to specific business needs. (University of Houston Downtown, 2017)

Business Intelligence Course

This course introduces Business Intelligence including the processes, methodologies, infrastructure, and current practices used to transform business data into information to support business decision-making such as performance evaluation, trend spotting, and policy making. Students are introduced to managerial issues, analytical components, and technologies related to data warehousing, data/text/Web mining, visual analytics along with reporting options such as management dashboards and balanced scorecard. (University of Houston Downtown, 2017)

Examples for Management of Information Systems Course

In the MIS course examples, there is an emphasis on showing the business use of information systems. In Table 4, the listing shows the sample data in Excel.

Table 4: MIS Class Sample Listing Showing Excel

	A	B	C	D	E	F	G
	Date	Hour	Offense Type	Beat	Premise	BlockRange	Street
	1/22/2017	12	Theft	10H10	Apartment	300-399	LIVE OAK
	1/23/2017	09	Theft	10H10	Residence or House	300-399	ENNIS
	1/24/2017	10	Theft	10H10	Apartment Parking Lot	2100-2199	CANAL
	1/24/2017	12	Theft	10H10	Apartment Parking Lot	2800-2899	CANAL
	1/24/2017	22	Theft	10H10	Apartment Parking Lot	2100-2199	RUNNELS
	1/26/2017	17	Theft	10H10	Road, Street, or Sidewalk	400-499	LOCKWOOD
	1/27/2017	08	Burglary	10H10	Laundry, Dry Cleaners, Washaterias	2000-2099	RUNNELS
	1/27/2017	19	Aggravated Assault	10H10	Road, Street, or Sidewalk	4400-4499	NAVIGATION
0	1/28/2017	15	Theft	10H10	Restaurant or Cafeteria Parking Lot	2800-2899	NAVIGATION
1	1/29/2017	21	Theft	10H10	Road, Street, or Sidewalk	2300-2399	COMMERCE
2	1/29/2017	22	Theft	10H10	Apartment Parking Lot	2100-2199	CANAL
3	1/30/2017	07	Theft	10H10	Road, Street, or Sidewalk	2400-2499	ROUFA

Utilizing Excel for Table 5, the example shows the technique of extraction, transformation and loading (ETL) to transform the data into day of week and provide the name of the month. Table 6 shows the results of using the ETL.

Table 5: Use of ETL (Extraction Transformation and Loading)

	A	B	C	D	E	F
	Date	Hour			Offense Type	
	42757	12	=TEXT(A2,"DDD")	=TEXT(A2,"MMM")	Theft	1
	42758	09			Theft	1

Table 6: Results of Use of ETL

	Date	Hour		Offense Type	Beat	Premise	BlockRange	Street	
	1/22/2017	12	Sun	Jan	Theft	10H10	Apartment	300-399	LIVE OAK
	1/23/2017	09	Mon	Jan	Theft	10H10	Residence or House	300-399	ENNIS
	1/24/2017	10	Tue	Jan	Theft	10H10	Apartment Parking Lot	2100-2199	CANAL

Table 7 illustrates how to aggregate the data and provides an example of Crime Totals by Premises.

Table 7: Crime Totals by Premises

Premises	Premise Total
Airport Terminal Count	59
Alley Count	3
Amusement Park, Bowling Alley, Skate Rink	4
Apartment Count	1003
Apartment Laundry Count	4
Apartment Parking Lot Count	1261
Apartment Rental Office Count	24
Auto Repair Count	46
Bank Count	17
Bank or Savings Institution Parking Lot Count	18
Bar or Night Club Count	95
Bar or Night Club Parking Lot Count	122
Barber And Beauty Shops Count	11
Body Shop Count	5
Book, Record, Stationary, Office Supplies Co	1
Bus Station Count	6
Bus Stop Count	28
Car Wash Count	22

Examples for Database Systems

In the Database systems Course, the Access Database is used to illustrate data retrieval using query languages. The examples used show examples with Access Structured Query Language (SQL). Figure 2 shows the use of SQL to search the records, using a date range delimiter. Table 8, shows an example of the date range search.

```
SELECT January_2017.Date, January_2017.Hour, January_2017.[Offense Type],
January_2017.Premise, January_2017.BlockRange, January_2017.StreetName,
January_2017.Type FROM January_2017 WHERE (((January_2017.Date) Between
#1/1/2017# And #1/7/2017#));
```

Figure 2: Access SQL to Search Records based on Date Range

Table 8: Result of Data Range Search

Date	Hour	Offense Typ	Premise	BlockRange	StreetName	Type
1/1/2017		Aggravated As	Apartment	2800-2899	CANAL	ST
1/1/2017	16	Theft		3600-3699	CANAL	ST
1/1/2017	18	Theft	Apartment Par	300-399	STILES	-
1/3/2017	15	Theft	Driveway	2300-2399	ANN	ST
1/4/2017	15	Theft	Driveway	UNK	CANAL	CT
1/5/2017	14	Burglary	Apartment	2100-2199	CANAL	ST
1/7/2017	09	Theft	Driveway	UNK	ENNIS	ST
1/7/2017	09	Theft	Driveway	5200-5299	JEFFERSON	ST
1/6/2017	17	Theft	Residence or H	1300-1399	ELLIOTTON	ST
1/6/2017	17	Auto Theft	Residence or H	1500-1599	ELLIOTT	ST
1/4/2017	10	Theft	Road, Street, o	4100-4199	WALKER	ST
1/1/2017	04	Auto Theft	Service or Gas:	4900-4999	POLK	-
1/2/2017	08	Burglary	Body Shop	4400-4499	GULF	FWY
1/2/2017	14	Auto Theft	Road, Street, o	1000-1099	ELLIOTT	ST
1/2/2017	16	Burglary	Miscellaneous	2600-2699	BELL	ST
1/1/2017	18	Theft	Bar or Night Cl	800-899	SAINT EMANUE	ST
1/1/2017	22	Aggravated As	Road, Street, o	1500-1599	ST EMANUEL	ST
1/4/2017	15	Robbery	Road, Street, o	3200-3299	LAMAR	-
1/3/2017	20	Theft	Road, Street, o	1100-1199	DELANO	-
1/3/2017	09	Theft	Road, Street, o	2100-2199	POLK	-
1/5/2017	16	Theft	Social Services	400-499	DOWLING	ST
1/7/2017	11	Theft	Road, Street, o	2200-2299	POLK	-

Another report is shown which illustrates a search on the premise code for premises beginning with the letter “P”. See Table 9.

Table 9: Premise Code Search on Letter “P”

January_2017 Data for Premise Codes Starting With "P"					
Offense Type	Premise	BlockRange	StreetName	Date	Hour
Theft	Police Station	6100-6199	INDUSTRIAL	1/14/2017	12
Burglary	Physician, Doctor, De	3000-3099	FANNIN	1/10/2017	04
Theft	Parks and Recreation,	5100-5199	OLD SPANISH	1/24/2017	20
Theft	Parks and Recreation,	4800-4899	MACGREGOR	1/24/2017	19
Auto Theft	Parks and Recreation,	5200-5299	CALHOUN	1/2/2017	14
Burglary	Parks and Recreation,	6100-6199	HERMANN PARK	1/22/2017	08
Theft	Parks and Recreation,	1500-1599	HERMANN	1/30/2017	11
Theft	Parks and Recreation,	1500-1599	HERMANN	1/30/2017	17
Theft	Parks and Recreation,	6000-6099	FANNIN	10/26/2016	20
Theft	Parks and Recreation,	1700-1799	HERMANN	1/10/2017	17
Theft	Parks and Recreation,	1700-1799	HERMANN	1/15/2017	08
Burglary	Parks and Recreation,	6100-6199	HERMANN PARK	1/19/2017	00
Robbery	Police Station	7500-7599	SHERMAN	12/29/2016	13
Burglary	Private School	1000-1099	CORAL	1/3/2017	09

Figure 3 shows how SQL can be used to accomplish a Date Range Search. Sample results of this query are shown in Table 10.

```
SELECT [January_2017 Query].[Date], [January_2017 Query].[Hour], [January_2017 Query].[Offense Type], [January_2017 Query].[Premise], [January_2017 Query].[BlockRange], [January_2017 Query].[StreetName], [January_2017 Query].[Type]
FROM [January_2017 Query]
WHERE ((([January_2017 Query].[Date]) Between [Enter Begin Date] And [End Date:]));
```

Figure 3: Date Range Search Using Access SQL

Table 10: Date Range Projection/Selection

Date	Hour	Offense Typ	Premise	BlockRange	StreetName	Type
1/1/2017		Aggravated Ass	Apartment	2800-2899	CANAL	ST
1/1/2017	16	Theft		3600-3699	CANAL	ST
1/1/2017	18	Theft	Apartment Par	300-399	STILES	-
1/3/2017	15	Theft	Driveway	2300-2399	ANN	ST
1/1/2017	04	Auto Theft	Service or Gas	4900-4999	POLK	-
1/2/2017	08	Burglary	Body Shop	4400-4499	GULF	FWY
1/2/2017	14	Auto Theft	Road, Street, o	1000-1099	ELLIOTT	ST
1/2/2017	16	Burglary	Miscellaneous	2600-2699	BELL	ST
1/1/2017	18	Theft	Bar or Night Cl	800-899	SAINT EMANUE	ST
1/1/2017	22	Aggravated Ass	Road, Street, o	1500-1599	ST EMANUEL	ST
1/3/2017	20	Theft	Road, Street, o	1100-1199	DELANO	-
1/3/2017	09	Theft	Road, Street, o	2100-2199	POLK	-
1/3/2017	08	Theft	Convenience S	4200-4299	MAIN	ST
1/3/2017	01	Theft	Road, Street, o	1100-1199	BREMOND	ST
1/3/2017	19	Burglary	Garage or Carp	3000-3099	CAROLINE	ST
1/1/2017	23	Auto Theft	Service or Gas	2100-2199	FANNIN	ST
1/1/2017	00	Theft	Road, Street, o	1100-1199	MCILHENNY	ST
1/2/2017	15	Aggravated Ass	Other Parking	4200-4299	SAN JACINTO	ST
1/2/2017	20	Theft	Apartment Par	1300-1399	BELFONTAINE	-
1/2/2017	03	Theft	Road, Street, o	1400-1499	MCILHENNY	ST
1/2/2017	03	Theft	Road, Street, o	3300-3399	CAROLINE	ST
1/2/2017	18	Robbery	Road, Street, o	3400-3499	BREMOND	ST
1/2/2017	15	Aggravated Ass	Road, Street, o	3000-3099	BREMOND	ST

Example for Microcomputer Applications

In the Microcomputer Applications course, both spreadsheet and database applications are emphasized as business productivity software tools. Using the sample Uniform Crime data, an example is provided using Excel. In Table 11, an Excel Pivot Table shows the aggregation by type of crimes by day of week. The data shows, by day of week, which crimes are more prevalent.

Table 11: Aggregation by Type of Crimes by Day of Week

Count of # offenses	Offense Type							Grand
Day	Aggravated Assault	Auto Theft	Burglary	Murder	Rape	Robbery	Theft	Total
Sun	198	178	177	2	15	152	824	1546
Mon	160	189	225		22	175	946	1717
Tue	157	145	243	4	8	137	915	1609
Wed	94	112	185	7	11	132	782	1323
Thu	109	133	227	1	6	99	834	1409
Fri	136	171	252	2	15	124	928	1628
Sat	144	135	199	5	16	118	869	1486
(blank)								
Grand Total	998	1063	1508	21	93	937	6098	10718

Example for Business Intelligence

In the Business Intelligence course, there is an emphasis on utilizing visual analytics along with reporting options. Table 12 provides an example of how the data can be filtered to show crimes occurring in parking lots. Table 13 provides a multidimensional analysis which shows crime distribution by hours of the day and types of crimes; it allows the viewer to see which crimes occurred at different times of the day. Table 14 shows a pivot chart listing total offenses by type.

In Table 15, Access is used to filter data so that a particular premise and street is selected. In this example, premise is equal to “Apartment” and street is “Main. The resulting report is shown in Table 16.

Table 12: Example Filtered by Parking Lot Crimes

Date	Hour	Offense Type	BlockRange	StreetName	Premise
1/30/2017	06	Robbery	1300-1399	GEARS	Apartment Parking Lot
1/10/2017	01	Aggravated Assault	1300-1399	GREENS	Apartment Parking Lot
1/15/2017	10	Theft	1300-1399	GREENS	Apartment Parking Lot
1/15/2017	16	Aggravated Assault	1300-1399	GREENS	Apartment Parking Lot
1/18/2017	09	Auto Theft	1300-1399	GREENS	Apartment Parking Lot
1/9/2017	13	Theft	1300-1399	REDFORD	Apartment Parking Lot
1/5/2017	06	Robbery	1300-1399	WITTE	Apartment Parking Lot
12/30/2016	16	Theft	1300-1399	WITTE	Apartment Parking Lot
1/20/2017	15	Theft	13100-13199	BELLFORT	Apartment Parking Lot
1/11/2017	04	Theft	13100-13199	BRIAR FOREST	Apartment Parking Lot
1/24/2017	16	Theft	13100-13199	CUTTEN	Apartment Parking Lot
1/26/2017	11	Aggravated Assault	13100-13199	NORTHBOROUGH	Apartment Parking Lot
1/25/2017	09	Theft	13100-13199	NORTHBOROUGH	Apartment Parking Lot
1/30/2017	15	Theft	13100-13199	WHITTINGTON	Apartment Parking Lot
1/7/2017	15	Theft	13200-13299	WESTHEIMER	Apartment Parking Lot
1/27/2017	10	Auto Theft	13300-13399	NORTHBOROUGH	Apartment Parking Lot
1/11/2017	21	Aggravated Assault	13300-13399	NORTHBOROUGH	Apartment Parking Lot
1/24/2017	07	Auto Theft	13400-13499	BRIAR FOREST	Apartment Parking Lot
1/13/2017	16	Theft	13500-13599	BRETON RIDGE	Apartment Parking Lot

Table 13: Crime Distribution by Hours and Type of Crimes for Multidimensional Analysis

Crime Distribution by Hours																										
Sum of # offenses	Hour																									
Offense Type	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Aggravated Assault	64	49	52	30	14	18	26	20	29	33	30	43	54	60	49	63	76	56	57	68	83	65	70	62		1171
Auto Theft	17	17	14	14	20	30	54	73	68	81	75	50	74	64	67	45	50	37	57	53	34	26	38	28		1086
Burglary	26	29	30	44	50	30	42	69	74	129	99	74	85	76	90	102	92	64	73	59	61	41	36	35		1510
Murder	1							1	1	1	2		1	1		1	1	1	2	1	1	1	2	4		22
Rape	3	4	1	2	4	4			2	2	9	4	6	7	6	7	8	5	7		4	2	3	5		95
Robbery	50	27	30	18	21	16	15	22	15	36	28	33	39	40	33	40	36	31	43	73	79	75	69	70		939
Theft	123	88	62	44	45	75	125	244	327	385	378	388	431	403	442	421	386	347	325	271	277	211	181	166	2	6147
Total	284	214	189	152	154	173	262	429	516	667	621	592	690	651	687	679	649	541	564	525	539	421	399	370	2	10970

Table 14: Total Offenses by Type - Pivot Pie Chart

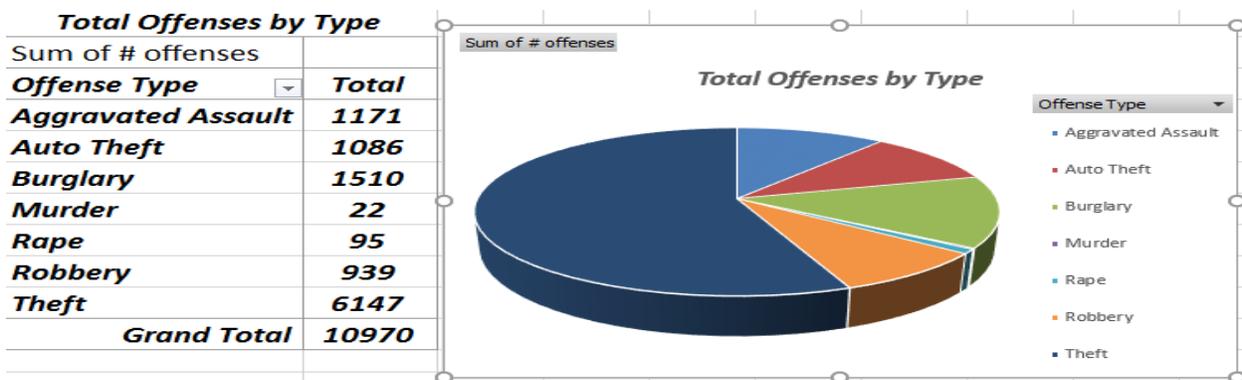


Table 15: Query Filter by Premise and Street - Using Access

Click Here for Crime St...

- Beat
- Premise
- BlockRange
- StreetName
- Type
- Suffix
- # offenses

Field:	[Date]	[Hour]	[Offense Type]	[Beat]	[Premise]	[StreetName]	[Type]
Table:	Click Here for Crime S	Click Here for Crime S	Click Here for Crime S	Click Here for Crime S	Click Here for Crime S	Click Here for Crime S	Click Here for Crime S
Sort:							
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:					Like "Apartment**"	Like "Main**"	
or:							

Table 16: Report Showing Data filtered by Premise/Street

Date	Hour	Offense Typ	Premise	StreetName	Type
10/16/2016		Burglary	Apartment	MAIN	ST
1/20/2017	16	Aggravated As	Apartment	MAIN	ST
1/21/2017	13	Theft	Apartment Parking Lot	MAIN	ST
1/26/2017	03	Theft	Apartment Parking Lot	MAIN	ST
1/9/2017	21	Theft	Apartment	MAIN	ST
*					

Using the UCR data and the software tools, students are introduced to reality-based education and can deep dive into critical data analysis, knowledge formation, and business intelligence to develop better analytical decision making skills. Faculty can utilize this data across a broad range of courses to foster both academic and pragmatic analytic skills longitudinally over the students' educational development.

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