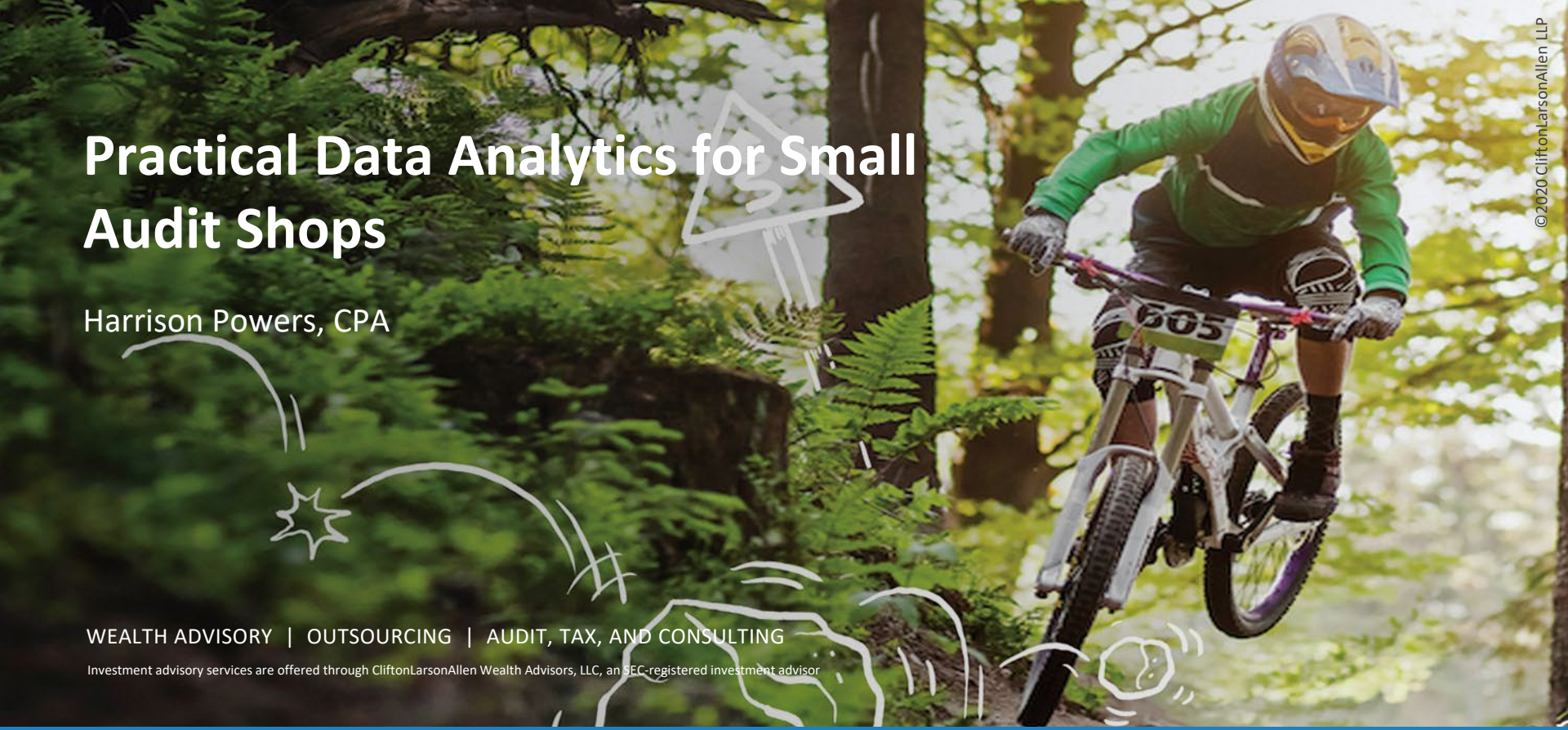
Practical Data Analytics for Small Audit Shops

Harrison Powers, CPA



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Create Opportunities

Agenda

- Data Analytics Defined
- Categories of Data Analytics
- Data Analytics Tools
- Process for Performing Data Analytics
- Example Uses of Data Analytics

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Key Takeaways

- Understand the definition of data analytics and the process for its proper application
- Be able to identify areas of the credit union in which the use of data analytics will be effective
- Understand how to use currently available tools to apply data analytics to populations

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Data Analytics Defined

- Data analytics is the process of inspecting, normalizing, and processing data in order to support decision making and draw conclusions.
- When performed effectively, data analytics allows you to examine significant amounts of data in a short period of time

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Data Fundamentals

- Structured Data vs. Unstructured Data
  - ◊ Structured data can be organized into columns and rows. Most financial data such as:
    - General Ledger
    - Cash Disbursements
    - Loan Transactions
    - Payroll
  - ◊ Unstructured data is everything else, such as files stored on a hard drive, e-mail, social media, most web information

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Data Fundamental - Relational Databases

- A relational database is when one table uses a unique identifier to look up records in another table
- Understanding what makes a record unique
- Unique identifiers: transaction ID, record number, vendor ID, employee ID, combination of fields
- Relational databases are a common and useful way for data to be stored. Most encountered database utilize relational databases

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Data Analytics Tools

- Spreadsheet/Excel
- Database Software; Access, SQL, others
- Auditing/Data Interrogation Software: IDEA, ACL
- Others
- Tools and Desired Capabilities
    - ◊ Analyze large sets of data efficiently
    - ◊ Work with many types of data
    - ◊ Robust analytical capability built in
    - ◊ Ability to program (macro, script) repeatable processes
    - ◊ Logging all procedures and work steps
    - ◊ Read Only
    - ◊ User Friendly

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Categories of Data Analytics

- Population
- People
- Trending
- Transaction

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Data Analytics Process

- What is your goal? What do you hope to accomplish?
- Data gathering
- Ensure population completeness
- Data normalization
- Data evaluation

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Examples of Data Analytics

- Benford's Law
- Journal Entries
- Loans
- Accounts Payable/Employee Expenditures

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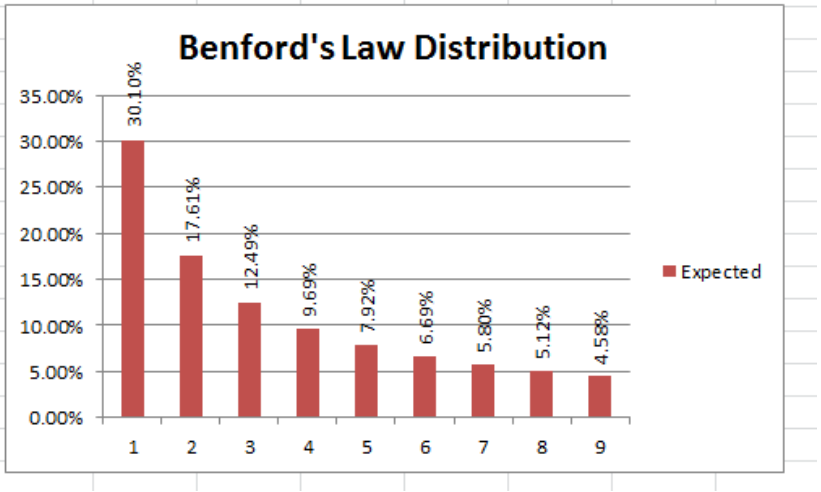
Benford's Law

- Mathematical principle that states in any large, randomly produced set of natural numbers, the leading digit of each number will occur a certain percentage of the time

Digit	Expected
1	30.10%
2	17.61%
3	12.49%
4	9.69%
5	7.92%
6	6.69%
7	5.80%
8	5.12%
9	4.58%
	100.00%



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Benford's Law

- Example: Use in Analyzing Expenditures
  - Manufacturing company which required dual signature on expenses over $5,000
  - Expenses under $5,000 only required an accounting employee's signature
  - Controller of company was embezzling funds by paying fictitious vendors
  - How could Benford's law have helped?

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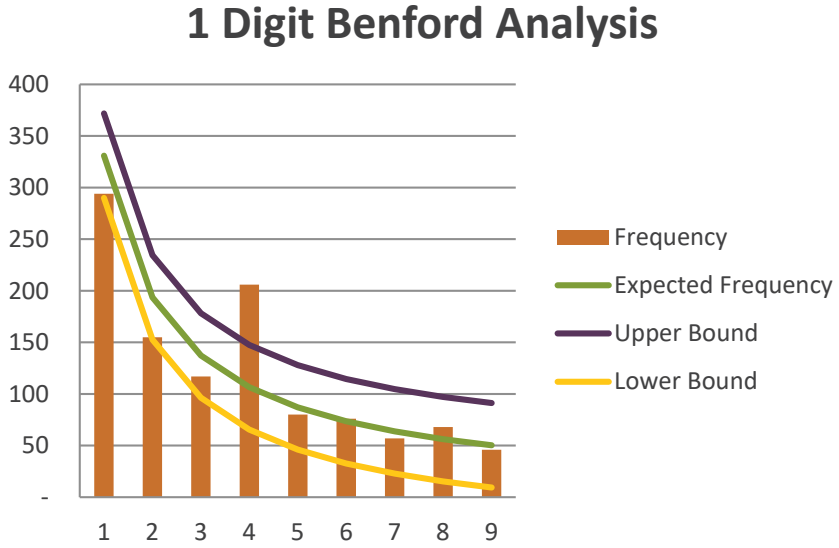
Benford's Law

- The Benford's law distribution of expenditures paid for this company is as follows:



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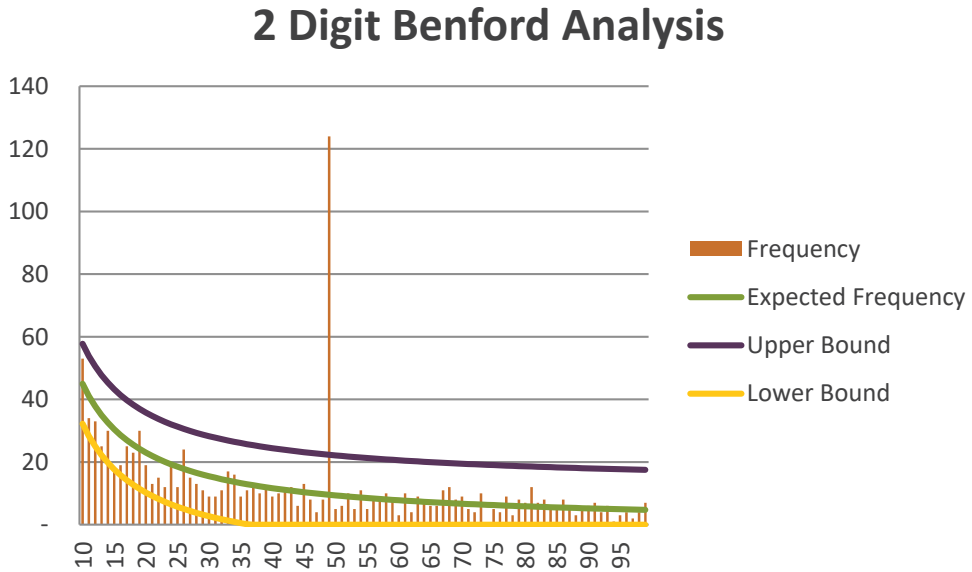
Benford's Law

- The 2 digit Benford's law distribution of expenditures paid for this company is as follows:



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Benford's Law

- The Controller was authorizing checks for just under $5,000, so the dual control procedure was not performed
- The application of Benford's Law would have identified an inconsistency in the data which would have been investigated

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Journal Entries

- What do we want to accomplish?
  - Identify unusual entries posted to the general ledger
- What types of data analytics would best serve our goal?
  - Population – Benford's Law
  - Trending – Are entries made on a monthly basis consistent?
  - People – Are any individual posting entries outside of normal business hours or different from other employees?

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Journal Entries

- First Step: Validate Completeness

	A	B	C	D	E	F	G	H
1	Account	Description	Beginning Balance	Debits	Credits	Ending Balance	GL Ending Balance	Check
2	1001001	VAULT CASH	213,688	5,485,759	5,467,121	232,326	232,326	-
3	1001051	ATM TELLER	10,400	521,140	521,140	10,400	10,400	-
4	1002101	TELLER 1	2,746	1,835,203	1,834,575	3,374	3,374	-
5	1002401	TELLER 4	5,840	3,839,941	3,840,293	5,488	5,489	(1)
6	1002501	TELLER 5	3,455	189,617	189,495	3,577	3,577	-
7	1002601	TELLER 6	5,011	2,538,124	2,538,584	4,551	4,551	-
8	1211101	US GOVTS>1YR-AVAIL FOR SALE	1,980,419	-	998,700	981,719	981,719	-
9	1212001	US GOVTS DISC ACCRETION	4,277	4,655	1,300	7,632	7,633	(1)
10	1213001	US GOVTS UNREALIZED GAIN/LOSS	6,163	21,718	22,349	5,532	5,532	-
11	1221101	US GOV AGENCIES-AVAIL FOR SALE	9,280,138	8,113,603	4,896,742	12,496,998	12,496,998	-
12	1221201	U.S. AGENCIES UNREALIZED GN/LS	35,421	79,949	92,276	23,094	23,095	(1)
13	1222001	US AGENCIES DISC ACCRE	402	297	-	699	699	-
14	1223001	US AGENCIES PREM AMORT	(90,890)	17,477	160,088	(233,501)	(233,501)	-
15	1300001	Commercial & Industrial	117,133	463,121	199,246	381,008	381,008	-
16	1300096	Commercial & Industrial	4,740,762	7,667,915	9,108,667	3,300,009	3,300,010	(1)
17	1300097	Commercial & Industrial	103,864	515,979	441,379	178,464	178,464	-
18	1300098	Commercial & Industrial	894,631	21,960	538,755	377,836	377,836	-
19	1310003	Other Const/Dev & Other Land	218,161	168,572	317,339	69,394	69,394	-
20	1310004	Other Const/Dev & Other Land	172,981	133,651	186,467	120,164	120,164	-
21	1310096	Other Const/Dev & Other Land	272,482	-	272,482	(0)	-	-
22	1310097	Other Const/Dev & Other Land	51,705	-	51,705	1	-	1
23	1310098	Other Const/Dev & Other Land	1,657,082	97,040	1,070,340	683,782	683,782	-
24	1311096	Commercial REM Owner Occupied	8,749,981	1,676,232	4,861,280	5,564,933	5,564,933	-
25	1311097	Commercial REM Owner Occupied	237,954	-	237,954	(0)	-	-
26	1313001	Commercial REM All Other	-	226,000	12,379	213,621	213,621	-
27	1313002	Commercial REM All Other	-	392,000	196,000	196,000	196,000	-
28	1313096	Commercial REM All Other	732,792	901,641	290,787	1,343,646	1,343,646	-

Sheet1

Ready

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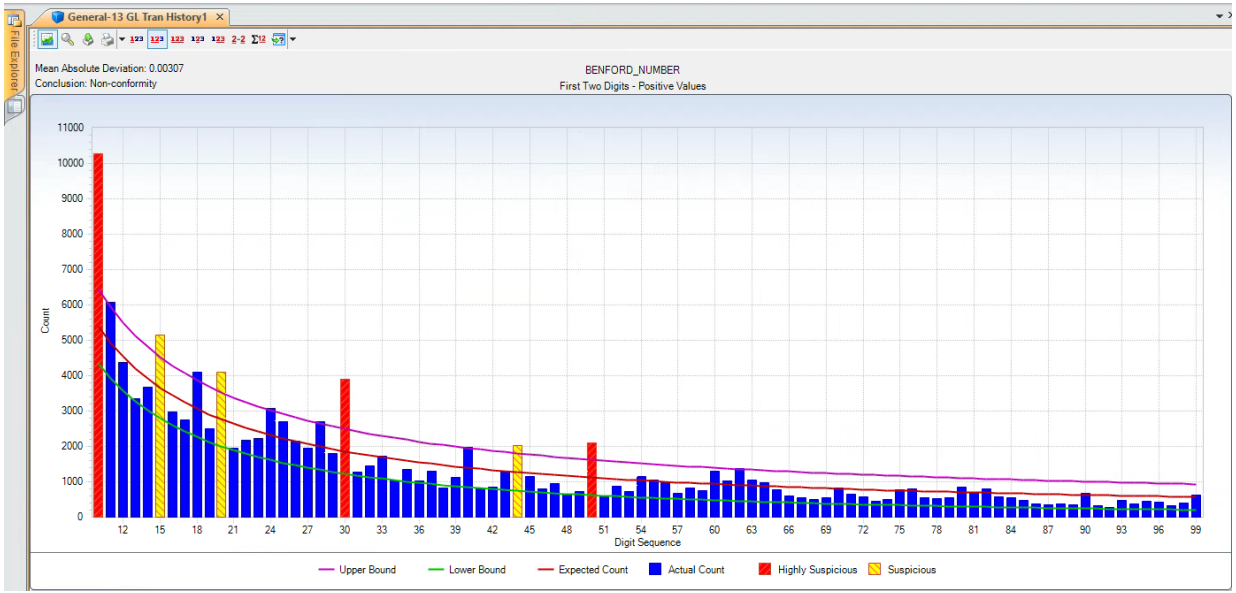
Journal Entries – Benford's Law

- Identify potential unusual entries through leading digit testing



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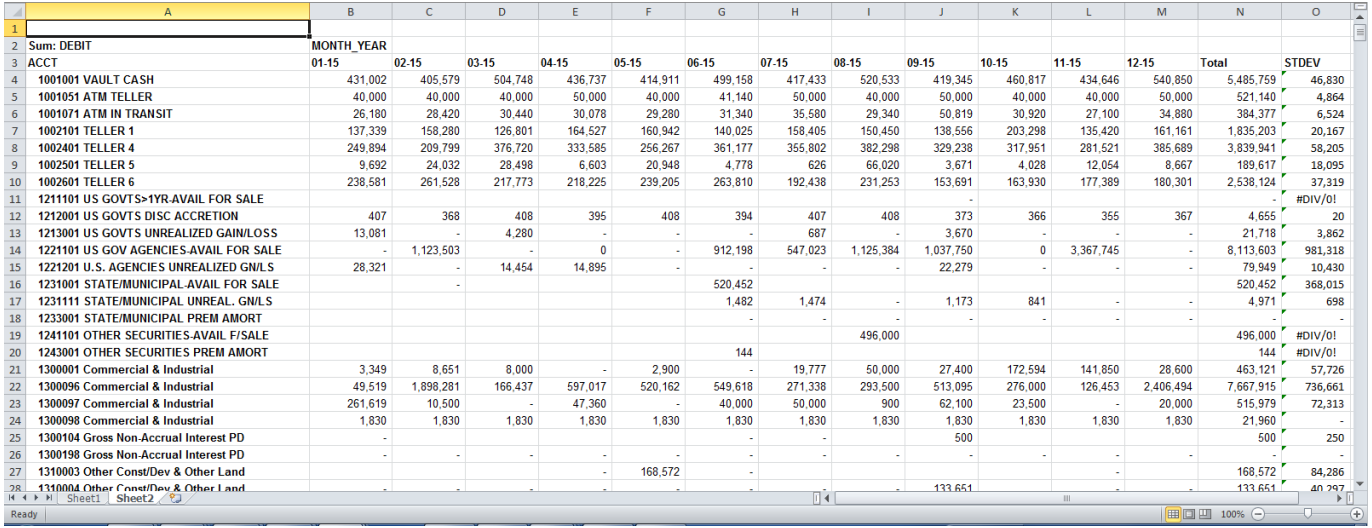
Journal Entries – Trending

- Scan for unusual entries or a high standard deviation (i.e. high volatility in entry amounts)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2	Sum: DEBIT	MONTH_YEAR													
3	ACCT	01-15	02-15	03-15	04-15	05-15	06-15	07-15	08-15	09-15	10-15	11-15	12-15	Total	STDEV
4	1001001 VAULT CASH	431,002	405,579	504,748	436,737	414,911	499,158	417,433	520,533	419,345	460,817	434,646	540,850	5,485,759	46,830
5	1001051 ATM TELLER	40,000	40,000	40,000	50,000	40,000	41,140	50,000	40,000	50,000	40,000	40,000	50,000	521,140	4,864
6	1001071 ATM IN TRANSIT	26,180	28,420	30,440	30,078	29,280	31,340	35,580	29,340	50,819	30,920	27,100	34,880	384,377	6,524
7	1002101 TELLER 1	137,339	158,280	126,801	164,527	160,942	140,025	158,405	150,450	138,556	203,298	135,420	161,161	1,835,203	20,167
8	1002401 TELLER 4	249,894	209,799	376,720	333,585	256,267	361,177	355,802	382,298	329,238	317,951	281,521	385,689	3,839,941	58,205
9	1002501 TELLER 5	9,692	24,032	28,498	6,603	20,948	4,778	626	66,020	3,671	4,028	12,054	8,667	189,617	18,095
10	1002601 TELLER 6	238,581	261,528	217,773	218,225	239,205	263,810	192,438	231,253	153,691	163,930	177,389	180,301	2,538,124	37,319
11	1211101 US GOVTS>1YR-AVAIL FOR SALE									-				-	#DIV/0!
12	1212001 US GOVTS DISC ACCRETION	407	368	408	395	408	394	407	408	373	366	355	367	4,655	20
13	1213001 US GOVTS UNREALIZED GAIN/LOSS	13,081	-	4,280	-	-	-	687	-	3,670	-	-	-	21,718	3,862
14	1221101 US GOV AGENCIES-AVAIL FOR SALE	-	1,123,503	-	0	-	912,198	547,023	1,125,384	1,037,750	0	3,367,745	-	8,113,603	981,318
15	1221201 U.S. AGENCIES UNREALIZED GN/LS	28,321	-	14,454	14,895	-	-	-	-	22,279	-	-	-	79,949	10,430
16	1231001 STATE/MUNICIPAL-AVAIL FOR SALE		-				520,452							520,452	368,015
17	1231111 STATE/MUNICIPAL UNREAL. GN/LS						1,482	1,474	-	1,173	841	-	-	4,971	698
18	1233001 STATE/MUNICIPAL PREM AMORT						-	-	-	-	-	-	-	-	-
19	1241101 OTHER SECURITIES-AVAIL F/SALE								496,000					496,000	#DIV/0!
20	1243001 OTHER SECURITIES PREM AMORT						144							144	#DIV/0!
21	1300001 Commercial & Industrial	3,349	8,651	8,000	-	2,900	-	19,777	50,000	27,400	172,594	141,850	28,600	463,121	57,726
22	1300096 Commercial & Industrial	49,519	1,898,281	166,437	597,017	520,162	549,618	271,338	293,500	513,095	276,000	126,453	2,406,494	7,667,915	736,661
23	1300097 Commercial & Industrial	261,619	10,500	-	47,360	-	40,000	50,000	900	62,100	23,500	-	20,000	515,979	72,313
24	1300098 Commercial & Industrial	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830	21,960	-
25	1300104 Gross Non-Accrual Interest PD	-					-	-		500				500	250
26	1300198 Gross Non-Accrual Interest PD	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	1310003 Other Const/Dev & Other Land				-	168,572	-					-		168,572	84,286
28	1310004 Other Const/Dev & Other Land	-	-	-	-	-	-	-	-	133,651	-	-	-	133,651	40,297

Sheet1 Sheet2

Ready 100%

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Journal Entries – People

- Can for unusual postings on weekends or unusual volumes by employee

	A	B	C	D	E	F	G	H	I	J	K
1											
2				DAY_OF_WEEK							
3	GL_ACCOUNT_FIELD	CHAR8	Data	1	2	3	4	5	6	7	Total
4	10000 Cash	Employee 1	Sum: DEBIT		102,117,415	83,979,946	134,909,335	55,440,559	75,662,116		452,109,371
5			Sum: CREDIT		76,297,425	70,137,771	131,074,313	45,903,091	131,695,683		455,108,284
6		Employee 2	Sum: DEBIT		-				20		20
7			Sum: CREDIT		20				143		163
8		Employee 3	Sum: DEBIT		14,597,387	1,596,126	8,846,545	970,684	1,282,083		27,292,826
9			Sum: CREDIT		10,027,732	1,545,687	8,417,894	845,020	2,638,018		23,474,351
10		Employee 4	Sum: DEBIT		1,385,304	1,513,079		-	1,513,607		4,411,990
11			Sum: CREDIT		2,248,905	1,241,291		51,400	2,553,916		6,095,512
12		Employee 5	Sum: DEBIT					143			143
13			Sum: CREDIT					-			-
14		Total Sum: DEBIT			118,100,106	87,089,151	143,755,880	56,411,386	78,457,826		483,814,349
15		Total Sum: CREDIT			88,574,083	72,924,749	139,492,207	46,799,511	136,887,760		484,678,310
16	10100 ATM	ADMIN	Sum: DEBIT		3,936,210	8,036,111	3,995,682	5,066,932	21,618,717		42,653,653
17			Sum: CREDIT		3,012,402	8,928,904	4,033,119	5,299,559	21,634,625		42,908,609
18		Employee 1	Sum: DEBIT		20	99,902		1,500			101,422
19			Sum: CREDIT		-	948		-			948
20		Employee 2	Sum: DEBIT		777,394	192,969	272,301	57,013	24,340		1,324,017
21			Sum: CREDIT		710,094	92,995	298,204	63,113	30,476		1,194,882
22		Employee 3	Sum: DEBIT		199,911	37,408			54,584		291,902
23			Sum: CREDIT		206,580	66,788			34,361		307,729
24		Employee 4	Sum: DEBIT		785	180,692	1,195	89,189	288		272,148
25			Sum: CREDIT		0	179,168	1,696	7	39,127		219,997
26		Employee 5	Sum: DEBIT		14	30,033	-	4,899	60		35,006
27			Sum: CREDIT		-	3,197	2,000	-	-		5,197
28		Employee 6	Sum: DEBIT		-	-	-	-	0		0

Sheet1 Sheet2 Sheet3 Sheet4

Ready

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Loans

- What do we want to accomplish?
  - Identify loan officers that originate higher than normal problem assets
  - Identify potential fictitious loans by looking for loans with no payments in the first year of origination
- What types of data analytics would best serve our goal?
  - People – Are any individual posting entries outside of normal business hours or different from other employees?
  - Transaction – Identify and review loans with no payments during first year of origination

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Loans

- First Step: Validate Completeness
  - This is typically achieved by reconciling the loan trial balance to the general ledger to ensure all reported loans on balance sheet are included in our population

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Loans - People

- Breakout past due and problem assets by loan officer to identify loan officers with high past due rates

	A	B	C	D	E	F	G	H	I	J
6	Sum: NET_PRINCIPAL	PAST_DUE							Officer %	
7	RESPONSIBILITY	15-29 Days	30-59 Days	Less Than 15	Nonaccrual	Not Past Due	Total		> 30 Days and Nonaccrual	< 30 Days
8	4			2,073,304		14,187,997	16,261,301		0.00%	100.00%
9	11					3,840,496	3,840,496		0.00%	100.00%
10	16		244,828	1,539,983		35,510,654	37,295,465		0.66%	99.34%
11	20			1,531,285		31,508,004	33,039,289		0.00%	100.00%
12	30					303,868	303,868		0.00%	100.00%
13	33			3,077,668	3,000,000	57,824,716	63,902,385		4.69%	95.31%
14	34					16,764,042	16,764,042		0.00%	100.00%
15	35					351,232	351,232		0.00%	100.00%
16	37			378,188		7,057,794	7,435,982		0.00%	100.00%
17	39		5,761	62,293		6,047,207	6,115,262		0.09%	99.91%
18	45					3,145,571	3,145,571		0.00%	100.00%
19	46			1,438,769		14,732,224	16,170,993		0.00%	100.00%
20	47			385,629		3,125,971	3,511,600		0.00%	100.00%
21	49	4,400		8,060,882		60,220,784	68,286,066		0.00%	100.00%
22	51			1,808,383		15,188,097	16,996,480		0.00%	100.00%
23	55	120,839		930,128		3,848,856	4,899,823		0.00%	100.00%
24	57			4,761,071		100,286,039	105,047,110		0.00%	100.00%
25	58			4,451,108		55,637,444	60,088,552		0.00%	100.00%
26	67			10,455,471		44,158,827	54,614,298		0.00%	100.00%
27	71	37,831	848,307	2,082,254		16,387,349	19,355,741		4.38%	95.62%
28	73	41,222		3,582,057	36,156	23,975,056	27,634,491		0.13%	99.87%
29	74	555,560		4,269,173		41,390,567	46,215,300		0.00%	100.00%
30	76			589,718		5,814,832	6,404,550		0.00%	100.00%
31	77			2,734,973		17,371,071	20,106,043		0.00%	100.00%
32	78			8,765,263		30,703,276	39,468,539		0.00%	100.00%
33	80	450,205	107,250	1,964,530	3,474,318	17,726,768	23,723,071		15.10%	84.90%
34	94	1,268,743		639,242		20,268,559	22,176,544		0.00%	100.00%
35	97	1,542,028		319,118		27,382,160	29,243,306		0.00%	100.00%

Past Due | Problem Loans

TRUE

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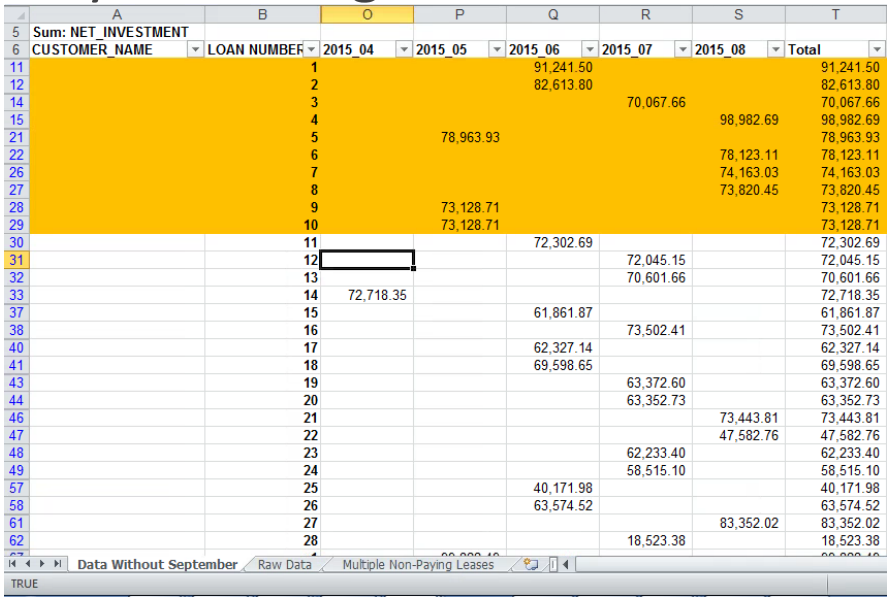
Loans – Transaction

- Investigate loans in which a payment has not been received within the first year of origination



	A	B	O	P	Q	R	S	T
5	Sum: NET_INVESTMENT							
6	CUSTOMER_NAME	LOAN NUMBER	2015_04	2015_05	2015_06	2015_07	2015_08	Total
11		1			91,241.50			91,241.50
12		2			82,613.80			82,613.80
14		3				70,067.66		70,067.66
15		4					98,982.69	98,982.69
21		5		78,963.93				78,963.93
22		6					78,123.11	78,123.11
26		7					74,163.03	74,163.03
27		8					73,820.45	73,820.45
28		9		73,128.71				73,128.71
29		10		73,128.71				73,128.71
30		11			72,302.69			72,302.69
31		12				72,045.15		72,045.15
32		13				70,601.66		70,601.66
33		14	72,718.35					72,718.35
37		15			61,861.87			61,861.87
38		16				73,502.41		73,502.41
40		17			62,327.14			62,327.14
41		18			69,598.65			69,598.65
43		19				63,372.60		63,372.60
44		20				63,352.73		63,352.73
46		21					73,443.81	73,443.81
47		22					47,582.76	47,582.76
48		23				62,233.40		62,233.40
49		24				58,515.10		58,515.10
57		25			40,171.98			40,171.98
58		26			63,574.52			63,574.52
61		27					83,352.02	83,352.02
62		28				18,523.38		18,523.38

Data Without September | Raw Data | Multiple Non-Paying Leases

TRUE

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Accounts Payable/Employee Expenditures

- What do we want to accomplish?
  - Identify potential fictitious vendors via unusual transaction activity
  - Identify unusual employee reimbursements for expenses
- What types of data analytics would best serve our goal?
  - Population – See example earlier in presentation
  - Trending – Are vendor payments consistent
  - People – Who is submitting expenses and what is their frequency and dollar volume

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Accounts Payable/Employee Expenditures

- First Step: Validate Completeness
  - Are you able to obtain a report directly from the system?
  - Can you reconcile the activity showed on the report to expenses recorded on the general ledger?
  - Typically the first option is the more practical approach. The auditor should obtain reporting directly from the system to limit the risk the data has been tampered with.

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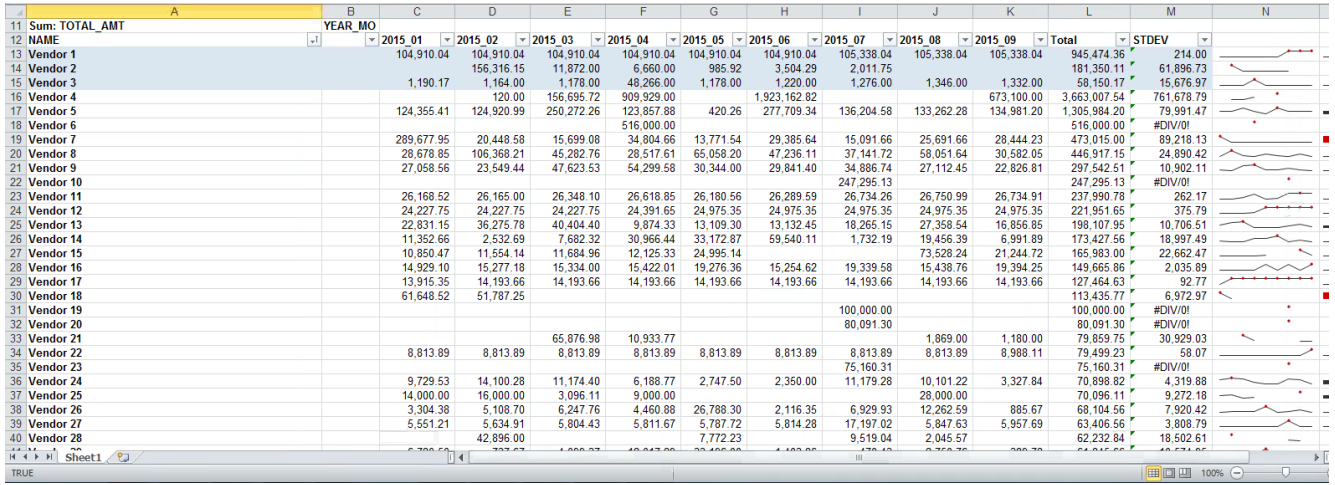
Accounts Payable/Employee Expenditures - Trending

- Review of unusual payments based on historical payments to vendors



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
11	Sum: TOTAL_AMT	YEAR_MO												
12	NAME		2015_01	2015_02	2015_03	2015_04	2015_05	2015_06	2015_07	2015_08	2015_09	Total	STDEV	
13	Vendor 1		104,910.04	104,910.04	104,910.04	104,910.04	104,910.04	104,910.04	105,338.04	105,338.04	105,338.04	945,474.36	214.00	
14	Vendor 2			156,316.15	11,872.00	6,660.00	985.92	3,504.29	2,011.75			181,350.11	61,896.73	
15	Vendor 3		1,190.17	1,164.00	1,178.00	48,266.00	1,178.00	1,220.00	1,276.00	1,346.00	1,332.00	58,150.17	15,676.97	
16	Vendor 4			120.00	156,695.72	909,929.00		1,923,162.82			673,100.00	3,663,007.54	761,678.79	
17	Vendor 5		124,355.41	124,920.99	250,272.26	123,857.88	420.26	277,709.34	136,204.58	133,262.28	134,981.20	1,305,984.20	79,991.47	
18	Vendor 6					516,000.00						516,000.00	#DIV/0!	
19	Vendor 7		289,677.95	20,448.58	15,699.08	34,804.66	13,771.54	29,385.64	15,091.66	25,691.66	28,444.23	473,015.00	89,218.13	
20	Vendor 8		28,678.85	106,368.21	45,282.76	28,517.61	65,058.20	47,236.11	37,141.72	58,051.64	30,582.05	446,917.15	24,890.42	
21	Vendor 9		27,058.56	23,549.44	47,623.53	54,299.58	30,344.00	29,841.40	34,886.74	27,112.45	22,826.81	297,542.51	10,902.11	
22	Vendor 10								247,295.13			247,295.13	#DIV/0!	
23	Vendor 11		26,168.52	26,165.00	26,348.10	26,618.85	26,180.56	26,289.59	26,734.26	26,750.99	26,734.91	237,990.78	262.17	
24	Vendor 12		24,227.75	24,227.75	24,227.75	24,391.65	24,975.35	24,975.35	24,975.35	24,975.35	24,975.35	221,951.65	375.79	
25	Vendor 13		22,831.15	36,275.78	40,404.40	9,874.33	13,109.30	13,132.45	18,265.15	27,358.54	16,856.85	198,107.95	10,706.51	
26	Vendor 14		11,352.66	2,532.69	7,682.32	30,966.44	33,172.87	59,540.11	1,732.19	19,456.39	6,991.89	173,427.56	18,997.49	
27	Vendor 15		10,850.47	11,554.14	11,684.96	12,125.33	24,995.14			73,528.24	21,244.72	165,983.00	22,662.47	
28	Vendor 16		14,929.10	15,277.18	15,334.00	15,422.01	19,276.36	15,254.62	19,339.58	15,438.76	19,394.25	149,665.86	2,035.89	
29	Vendor 17		13,915.35	14,193.66	14,193.66	14,193.66	14,193.66	14,193.66	14,193.66	14,193.66	14,193.66	127,464.63	92.77	
30	Vendor 18		61,648.52	51,787.25								113,435.77	6,972.97	
31	Vendor 19								100,000.00			100,000.00	#DIV/0!	
32	Vendor 20								80,091.30			80,091.30	#DIV/0!	
33	Vendor 21				65,876.98	10,933.77				1,869.00	1,180.00	79,859.75	30,929.03	
34	Vendor 22		8,813.89	8,813.89	8,813.89	8,813.89	8,813.89	8,813.89	8,813.89	8,813.89	8,988.11	79,499.23	58.07	
35	Vendor 23								75,160.31			75,160.31	#DIV/0!	
36	Vendor 24		9,729.53	14,100.28	11,174.40	6,188.77	2,747.50	2,350.00	11,179.28	10,101.22	3,327.84	70,898.82	4,319.88	
37	Vendor 25		14,000.00	16,000.00	3,096.11	9,000.00				28,000.00		70,096.11	9,272.18	
38	Vendor 26		3,304.38	5,108.70	6,247.76	4,460.88	26,788.30	2,116.35	6,929.93	12,262.59	885.67	68,104.56	7,920.42	
39	Vendor 27		5,551.21	5,634.91	5,804.43	5,811.67	5,787.72	5,814.28	17,197.02	5,847.63	5,957.69	63,406.56	3,808.79	
40	Vendor 28			42,896.00			7,772.23		9,519.04	2,045.57		62,232.84	18,502.61	

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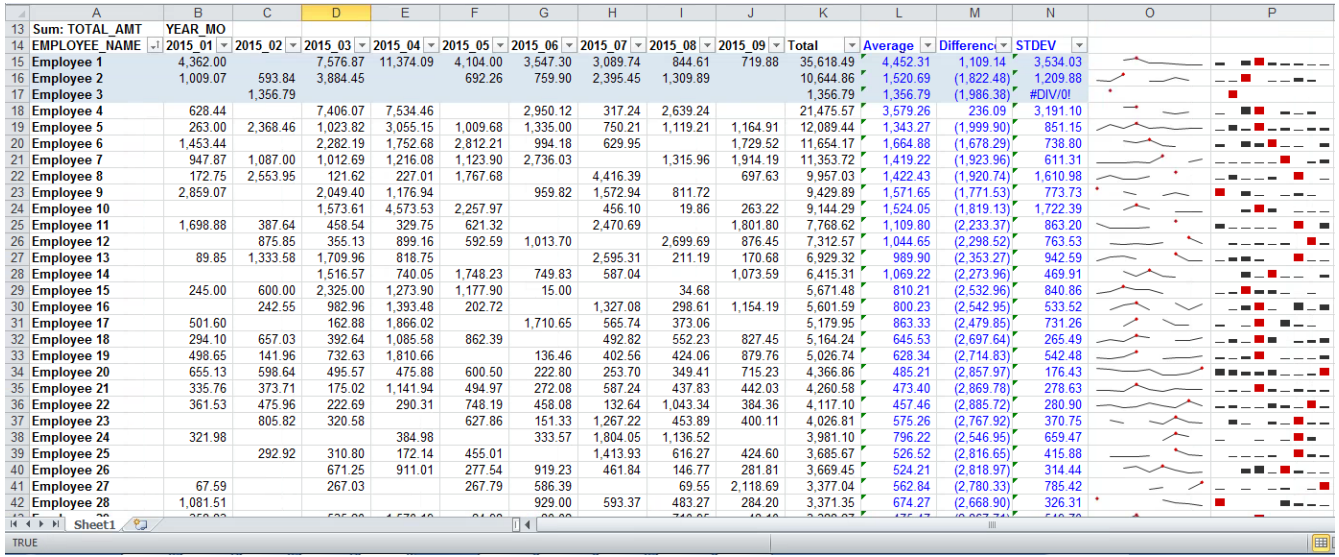
Accounts Payable/Employee Expenditures – People

- Review trends in expense submissions to those of other employees, as well as historical submissions



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
13	Sum: TOTAL_AMT	YEAR_MO														
14	EMPLOYEE_NAME	2015_01	2015_02	2015_03	2015_04	2015_05	2015_06	2015_07	2015_08	2015_09	Total	Average	Differenc	STDEV		
15	Employee 1	4,362.00		7,576.87	11,374.09	4,104.00	3,547.30	3,089.74	844.61	719.88	35,618.49	4,452.31	1,109.14	3,534.03		
16	Employee 2	1,009.07	593.84	3,884.45		692.26	759.90	2,395.45	1,309.89		10,644.86	1,520.69	(1,822.48)	1,209.88		
17	Employee 3		1,356.79								1,356.79	1,356.79	(1,986.38)	#DIV/0!		
18	Employee 4	628.44		7,406.07	7,534.46		2,950.12	317.24	2,639.24		21,475.57	3,579.26	236.09	3,191.10		
19	Employee 5	263.00	2,368.46	1,023.82	3,055.15	1,009.68	1,335.00	750.21	1,119.21	1,164.91	12,089.44	1,343.27	(1,999.90)	851.15		
20	Employee 6	1,453.44		2,282.19	1,752.68	2,812.21	994.18	629.95		1,729.52	11,654.17	1,664.88	(1,678.29)	738.80		
21	Employee 7	947.87	1,087.00	1,012.69	1,216.08	1,123.90	2,736.03		1,315.96	1,914.19	11,353.72	1,419.22	(1,923.96)	611.31		
22	Employee 8	172.75	2,553.95	121.62	227.01	1,767.68		4,416.39		697.63	9,957.03	1,422.43	(1,920.74)	1,610.98		
23	Employee 9	2,859.07		2,049.40	1,176.94		959.82	1,572.94	811.72		9,429.89	1,571.65	(1,771.53)	773.73		
24	Employee 10			1,573.61	4,573.53	2,257.97		456.10	19.86	263.22	9,144.29	1,524.05	(1,819.13)	1,722.39		
25	Employee 11	1,698.88	387.64	458.54	329.75	621.32		2,470.69		1,801.80	7,768.62	1,109.80	(2,233.37)	863.20		
26	Employee 12		875.85	355.13	899.16	592.59	1,013.70		2,699.69	876.45	7,312.57	1,044.65	(2,298.52)	763.53		
27	Employee 13	89.85	1,333.58	1,709.96	818.75			2,595.31	211.19	170.68	6,929.32	989.90	(2,353.27)	942.59		
28	Employee 14			1,516.57	740.05	1,748.23	749.83	587.04		1,073.59	6,415.31	1,069.22	(2,273.96)	469.91		
29	Employee 15	245.00	600.00	2,325.00	1,273.90	1,177.90	15.00		34.68		5,671.48	810.21	(2,532.96)	840.86		
30	Employee 16		242.55	982.96	1,393.48	202.72		1,327.08	298.61	1,154.19	5,601.59	800.23	(2,542.95)	533.52		
31	Employee 17	501.60		162.88	1,866.02		1,710.65	565.74	373.06		5,179.95	863.33	(2,479.85)	731.26		
32	Employee 18	294.10	657.03	392.64	1,085.58	862.39		492.82	552.23	827.45	5,164.24	645.53	(2,697.64)	265.49		
33	Employee 19	498.65	141.96	732.63	1,810.66		136.46	402.56	424.06	879.76	5,026.74	628.34	(2,714.83)	542.48		
34	Employee 20	655.13	598.64	495.57	475.88	600.50	222.80	253.70	349.41	715.23	4,366.86	485.21	(2,857.97)	176.43		
35	Employee 21	335.76	373.71	175.02	1,141.94	494.97	272.08	587.24	437.83	442.03	4,260.58	473.40	(2,869.78)	278.63		
36	Employee 22	361.53	475.96	222.69	290.31	748.19	458.08	132.64	1,043.34	384.36	4,117.10	457.46	(2,885.72)	280.90		
37	Employee 23		805.82	320.58		627.86	151.33	1,267.22	453.89	400.11	4,026.81	575.26	(2,767.92)	370.75		
38	Employee 24	321.98			384.98		333.57	1,804.05	1,136.52		3,981.10	796.22	(2,546.95)	659.47		
39	Employee 25		292.92	310.80	172.14	455.01		1,413.93	616.27	424.60	3,685.67	526.52	(2,816.65)	415.88		
40	Employee 26			671.25	911.01	277.54	919.23	461.84	146.77	281.81	3,669.45	524.21	(2,818.97)	314.44		
41	Employee 27	67.59		267.03		267.79	586.39		69.55	2,118.69	3,377.04	562.84	(2,780.33)	785.42		
42	Employee 28	1,081.51					929.00	593.37	483.27	284.20	3,371.35	674.27	(2,668.90)	326.31		

Sheet1

TRUE

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Conclusion

- Data analytics is a means to analyze large volumes of data
- When setup properly, meaningful results can be generated to focus audit procedures, and identify potential malicious activity
- You most likely can perform data analytics with tools already available to you

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Thank You

Any Questions?

Harrison Powers, CPA
Manager
214-725-4551
Harrison.Powers@claconnect.com

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