



APRIL 14, 2015

VBA FINAL PROJECT

SURVEY DATASET RECODING & STATISTICAL ANALYSIS

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Executive Summary

Lindon City is located just north of Orem, and has a population size of roughly 10,500 residents. Lindon is a unique city in that it is a full-service city, despite its small size. A full-service city is a city which provides all of the services needed to operate a city, including fire and police services. Lindon has a significant commercial tax base which allows it to provide more services than other cities of similar size.

To help measure their service satisfaction levels, the city put out a service satisfaction survey to those who interact regularly with members of the city staff. The survey was placed on the front desks of various departments in the City, and as visitors converse with a member of the city staff, they are asked if they would provide some feedback about their experience in the survey.

As these survey responses are collected, the City Administrator asked me if I would come up with a way to analyze our collected responses. To do this, I created an Excel model where survey responses can be entered into Excel through help of a form. The user can then run statistics on the data by clicking a button which will automatically recode the data and output some statistics.

Since most of the surveys taken are paper surveys, I tried to create an interface that would make input into the Excel spreadsheet as easy as possible. When the user clicks on the “Input Form” button, a user form pops up. The user form allows users to simply click the responses reported on the survey, and once the user clicks “Enter,” the appropriate fields are automatically populated in the spreadsheet. Once the user is finished inputting survey responses, the user can close the form by clicking “Close.”

Once the user is ready to analyze the data, the user can click the button “Statistics.” This button runs a macro that recodes the data into a format that can be analyzed, and then a statistical analysis is displayed in the spreadsheet. The macro works by looking at each of the values that were input into the spreadsheet and assigns each value a specified number. These numbers correlated to a typical Lickert Scale. Once each response is recoded, the recoded numbers are populated in a separate spreadsheet. The macro then opens the statistical analysis package included in the Excel software, and selects the appropriate ranges to be analyzed. The macro then runs the summary statistics package for each selected range in the recoded worksheet and places the outputs in a specified worksheet to be displayed to the user.

Documentation

Upon opening the service satisfaction spreadsheet, there are two buttons in the top left corner of the spreadsheet. Clicking on the “Input Form” button opens a form where the user may select data to populate the form.

Input Form		Statistics				Service Satisfaction Questionnaire	
Department	Wait Time	Representative Courteous?	Representative Prompt?	Representative Knowledgeable?	Request Handled to Satisfaction		
Justice Court	Less than 5 min	Disagree	Agree	Neutral	Disagree		
Community Development	5-10 min	Disagree	Agree	Neutral	Strongly Agree		
Parks & Recreation	Less than 5 min	Disagree	Agree	Disagree	Agree		
Public Works	5-10 min	Disagree	Agree	Neutral	Disagree		
Community Development	0 minutes	Disagree	Disagree	Neutral	Disagree		
Administration/Front Desk	Less than 5 min	Strongly Agree	Agree	Disagree	Agree		
Community Development	Over 10 min	Neutral	Strongly Disagree	Agree	Strongly Disagree		
Public Works	0 minutes	Agree	Strongly Agree	Strongly Agree	Neutral		
Parks & Recreation	5-10 min	Strongly Disagree	Neutral	Strongly Disagree	Agree		
Justice Court	Over 10 min	Agree	Disagree	Agree	Strongly Agree		
Justice Court	Less than 5 min	Disagree	Agree	Neutral	Disagree		
Community Development	5-10 min	Disagree	Agree	Neutral	Strongly Agree		
Parks & Recreation	Less than 5 min	Disagree	Agree	Disagree	Agree		
Public Works	5-10 min	Disagree	Agree	Neutral	Disagree		
Community Development	0 minutes	Disagree	Disagree	Neutral	Disagree		
Administration/Front Desk	Less than 5 min	Strongly Agree	Agree	Disagree	Agree		
Community Development	Over 10 min	Neutral	Strongly Disagree	Agree	Strongly Disagree		
Public Works	0 minutes	Agree	Strongly Agree	Strongly Agree	Neutral		
Parks & Recreation	5-10 min	Strongly Disagree	Neutral	Strongly Disagree	Agree		
Justice Court	Over 10 min	Agree	Disagree	Agree	Strongly Agree		

By clicking on the form’s radio buttons, the user can select how the form will be populated. The form also allows for text to be input with the additional comments and email sections. Once the user clicks “Enter,” the form will populate on the last open row of the table. The form will remain open for any additional entries. The user can close the form by clicking “Close.”

Input Form

Department

☐ Administration/Front Desk

☐ Community Development

☐ Justice Court

☐ Parks & Recreation

☐ Police Department

☐ Public Works

Wait Time

☐ 0 minutes

☐ Less than 5 min

☐ 5-10 min

☐ Over 10 min

Representative Courteous?

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

Representative Prompt?

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

Representative Knowledge?

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

Satisfactory Manner?

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

Additional Comments

Newsletter?

☐ Yes ☐ No

Email:

Close

Enter

Once the spreadsheet has been populated, the user can run statistics on the data by clicking the “Statistics” button.

Input Form		Statistics				Service Satisfaction Questionnaire					
Department	Wait Time	Representative Courteous?	Representative Prompt?	Representative Knowledgeable?	Request Handled to Satisfaction?	Request Handled to Satisfaction?	Request Handled to Satisfaction?	Request Handled to Satisfaction?	Request Handled to Satisfaction?	Request Handled to Satisfaction?	Request Handled to Satisfaction?
Justice Court	Less than 5 min	Disagree	Agree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Community Development	5-10 min	Disagree	Agree	Neutral	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Parks & Recreation	Less than 5 min	Disagree	Agree	Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Public Works	5-10 min	Disagree	Agree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Community Development	0 minutes	Disagree	Disagree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Administration/Front Desk	Less than 5 min	Strongly Agree	Agree	Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Community Development	Over 10 min	Neutral	Strongly Disagree	Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
Public Works	0 minutes	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Parks & Recreation	5-10 min	Strongly Disagree	Neutral	Strongly Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Justice Court	Over 10 min	Agree	Disagree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Justice Court	Less than 5 min	Disagree	Agree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Community Development	5-10 min	Disagree	Agree	Neutral	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Parks & Recreation	Less than 5 min	Disagree	Agree	Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Public Works	5-10 min	Disagree	Agree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Community Development	0 minutes	Disagree	Disagree	Neutral	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree	Disagree
Administration/Front Desk	Less than 5 min	Strongly Agree	Agree	Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Community Development	Over 10 min	Neutral	Strongly Disagree	Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
Public Works	0 minutes	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Parks & Recreation	5-10 min	Strongly Disagree	Neutral	Strongly Disagree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
Justice Court	Over 10 min	Agree	Disagree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

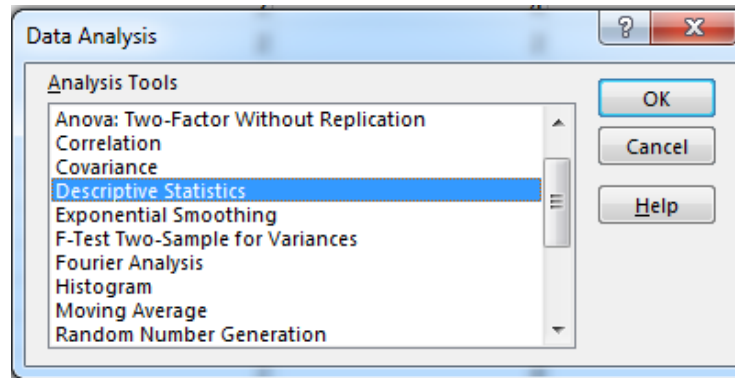
The statistics button does two things. First, it takes all the data that has been populated in the spreadsheet, and gives it a numerical value. The data is recorded in preparation to have statistics run on the data.

Service Satisfaction Questionnaire						
Department	Wait Time	Representative Courteous?	Representative Prompt?	Representative Knowledgeable?	Request Handled to Satisfaction?	Newsletter?
3	2	2	4	3	2	1
2	3	2	4	3	5	0
4	2	2	4	2	4	1
5	3	2	4	3	2	0
2	1	2	2	3	2	0
1	2	5	4	2	4	0
2	4	3	1	4	1	0
5	1	4	5	5	3	1
4	3	1	3	1	4	0
3	4	4	2	4	5	0
3	2	2	4	3	2	1
2	3	2	4	3	5	0
4	2	2	4	2	4	1
5	3	2	4	3	2	0
2	1	2	2	3	2	0
1	2	5	4	2	4	0
2	4	3	1	4	1	0
5	1	4	5	5	3	1
4	3	1	3	1	4	0
3	4	4	2	4	5	0
3	2	2	4	3	2	1
2	3	2	4	3	5	0
4	2	2	4	2	4	1
5	3	2	4	3	2	0
2	1	2	2	3	2	0
1	2	5	4	2	4	0
2	4	3	1	4	1	0
5	1	4	5	5	3	1
4	3	1	3	1	4	0
3	4	4	2	4	5	0
1	2	2	4	2	2	1

The recoding is done with “If” statements and “Do Loops.”

Second, once the data has been recoded, the macro checks to see if the user has installed the Analysis ToolPak for Microsoft Excel. If the user hasn't installed it, the macro does it for them.

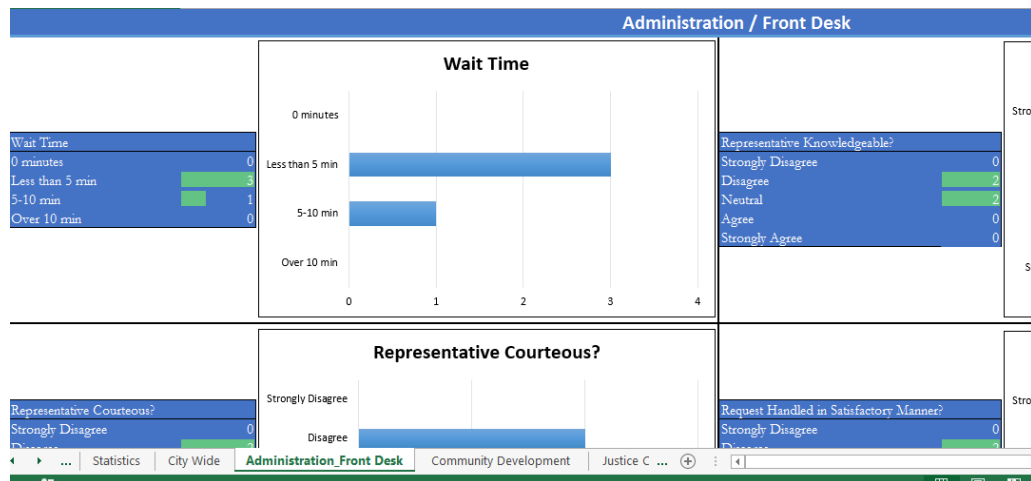
Descriptive statistics are then run on the recoded variables.



Once the statistics have been run, the user is then taken to the Statistics Spreadsheet. The Statistics are broken down by each variable on this spreadsheet.

Department		Wait Time		Representative Courteous?		Representative Prompt?		Representative Knowledgeable?
Mean	3	Mean	2.481481	Mean	2.666667	Mean	3.296296	Mean
Standard Error	0.26688	Standard Error	0.195172	Standard Error	0.226455	Standard Error	0.231524	Standard Error
Median	3	Median	2	Median	2	Median	4	Median
Mode	2	Mode	2	Mode	2	Mode	4	Mode
Standard Deviation	1.38675	Standard Deviation	1.014145	Standard Deviation	1.176697	Standard Deviation	1.203035	Standard Deviation
Sample Variance	1.923077	Sample Variance	1.02849	Sample Variance	1.384615	Sample Variance	1.447293	Sample Variance
Kurtosis	-1.30957	Kurtosis	-1.0099	Kurtosis	-0.34667	Kurtosis	-0.64824	Kurtosis
Skewness	0.093456	Skewness	0.054192	Skewness	0.866833	Skewness	-0.76702	Skewness
Range	4	Range	3	Range	4	Range	4	Range
Minimum	1	Minimum	1	Minimum	1	Minimum	1	Minimum
Maximum	5	Maximum	4	Maximum	5	Maximum	5	Maximum
Sum	81	Sum	67	Sum	72	Sum	89	Sum
Count	27	Count	27	Count	27	Count	27	Count
Confidence Level(95.0%)	0.54858	Confidence Level(95.0%)	0.401182	Confidence Level(95.0%)	0.465486	Confidence Level(95.0%)	0.475905	Confidence Level(95.0%)

Built in to the model are individual tabs for each department. By clicking on each tab, the user is displayed bar charts for each variable which highlight the results in each department.



Discussion of Learning

My original idea was to simply do the recoding. Doing this process I learned a lot about Do-Loops. For each variable in the data set, I had to write a Loop that would continue to recode as little, or as much, data as was input. Making the Loop dynamic was a challenge at first, but after a couple classes on the subject, I was able to easily account for a dynamic dataset.

I was going to end my project with a simple recoding, but after going through user forms in class, I decided that would be a good component to add. Upon my initial submission for the project, Dr. Allen suggested that I have my code automatically download survey data from an online source. That was a great idea, but the City Administrator for Lindon City thought it more practical to have short paper surveys at different departments in the City. I knew that inputting data from a paper survey could be somewhat troublesome, so I wanted to make it as easy as possible to enter data from a paper survey in the model. That's when I decided to add a user form component that would allow a user to simply select what needed to be placed in the dataset.

I definitely spent over 40 hours working on this project. Most of my time was spent troubleshooting certain errors that would come up as I ran my program, but I eventually figured it out. Putting this together was definitely a challenge at times, but I learned a lot because of it.

I worked on this project solo.