

# **Assessment for MGMT 555 Business Research Methods Second Session, Fall 2018**

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MGMT 555 Business Research Methods (BRM) is a course required of all degree earning graduate business students except those who are enrolled in the Master of Health Administration program. Students need a basic understanding of linear regression as it is the basis for analytics in business environments. BRM is also an introductory course for MBA students in analytics, as well as for MSPA students. For those students, understanding linear regression is an outcome of this course that sets them up to expand on their understanding of various forms of regression in Big Data Analytics.

## **Student Learning Objective Being Assessed**

- describe the meaning of various statistical analyses (evaluation).

## **Assessment Question**

Were students able to explain fully and draw reasonable conclusions about regression analysis outputs?

## **Process of Assessment**

Students spent three weeks studying regression and practicing with assigned problems. Two final assignments were made in the last two weeks of the session requiring students to apply multiple linear regression tools to data. The first problem required students to make a choice about a marketing promotion for a fast food store. The second problem required students to predict housing or air pollution levels, depending on the dependent variable assigned to them, for communities around Boston. Students were asked to complete the regression runs and produce a report for each assignment that described the data, procedures, resulting model(s) they produced, and conclusions from their work.

Two assignments were examined to understand if feedback to students from their first assignment was helpful for improving their second assignment submission. A solution set was posted to all students immediately after the deadline for submission of the first problem was reached. That solution set demonstrated standards for reporting results and drawing conclusions.

Student assignments were assessed by the instructor against a rubric developed for this effort. The rubric is included in the appendix to this report. Student submissions were read and commented upon. Students' achievement at meeting the rubric standards were assessed using the rubric which had four categories ranging from Full Marks to No Marks with each category anchored to specific expectations. The rubric was shared with students with the assignment prior to its due date. This assessment specifically looks at students' results and conclusions from their linear regression results.

## Results

Figure 1 shows the results for the results and conclusions section of the rubric for the first assignment and the second or final assignment. There were 19 students in the class.

Figure 1. Rubric Scores for Two Regression Assignments by Level of Marks Earned

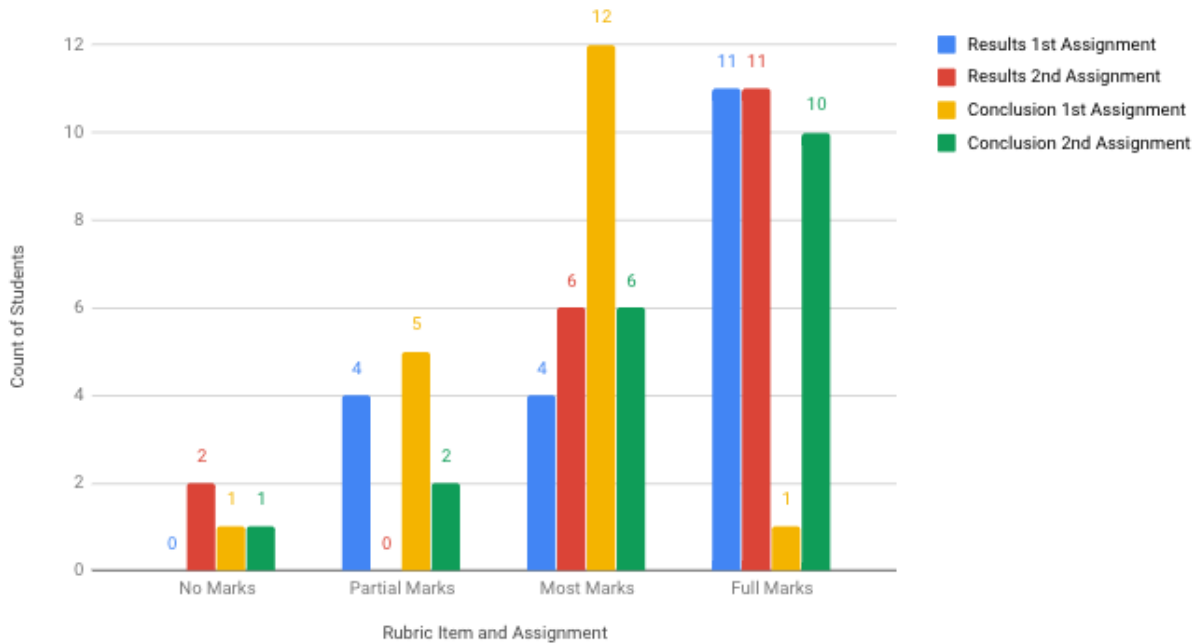


Figure 1 is organized by the rubric scores or marks: No Marks, Partial Marks, Most Marks, and Full Marks. Most students' work received Most or Full Marks for the results and conclusions for both assignments. A few students struggled with the assignments earning No Marks or only Partial Marks.

For the results section, 57.9% (11 of 19) received Full Marks for their descriptions of the results of their linear regression analysis. Slightly fewer, 10 of 19 or 52.6%, earned Full Marks for the conclusions they wrote for their linear regression analysis.

More students earned More Marks in explaining the results of their linear regression work in the second assignment; those earning Full Marks remained unchanged from the first to the second assignment. Most students, 18 of the 19, earned Most or Full Marks for their results discussion in the final assignment as opposed to only 15 in the first assignment.

With respect to their conclusions, 12 students earned Most Marks for the first assignment but only six did so for the second assignment. However, only one student earned Full Marks on the conclusion of the first assignment while 10 earned that rank on the second assignment. This result suggests many of those with Most Marks for their conclusions in the first assignment improved their work for the second assignment.

Table 1 shows the number of students improving, worsening, or showing no change in their scores for the results and conclusions section based on the rubrics. Students improved (52.6%) their conclusion submission from the first to the second assignment though many (47.4%)

remained at the same level of marks. Students' results section showed less improvement, though, more students had Full Marks in both results session as can be seen in Figure 1 than they did for the conclusion.

Table 1. Number of Students Showing Change in Their Rubric Scores From the First to the Second Assignment

Level of Change Shown	Results	Conclusions
Improved	4 21.1%	10 52.6%
No Change	11 57.9%	9 47.4%
Worse	4 21.1%	0 0.0%
Column Total	19 100%	19 100%

## Discussion

Just over half of the students in the class earned Full Marks for fully explaining their linear regression results and drawing conclusions in the last assignment. These results show more work is needed to communicate the concepts of linear regression to students.

The BRM class is offered as an eight-week hybrid/blended format course. Linear regression is only one topic covered among others in the class, including defining research questions, research design, survey design and implementation, scale development, and research ethics. Linear regression, however, is a very important topic because BRM prepares students for further analytics classes. More time needs to be spent working on linear regression in the class with students.

Students were able to improve their conclusions using feedback from previous assignments. This result suggests that using more of the eight-week session to discuss and complete problems using linear regression could lead to more students earning Full Marks on results and conclusions sections of their assignments.

## Suggested Changes

Based on these results the following changes will be tried in the next offering of BRM in the Spring 2019 semester with the goal of improving students scores in working with linear regression results and conclusions.

1. **Develop datasets to be used for linear regression demonstrations and assignments that are business specific.** There are few such datasets available in the public domain. Most public domain data is governmentally sourced and while useful for this class does not demonstrate business uses of linear regression. Introducing business uses of linear regression will make the topic more germane to students thus more likely

that they will take the technique and apply it to their workplaces further developing their knowledge and skills.

2. **Start discussing linear regression earlier in the session.** Linear regression was not introduced to the students until the fifth week of the session. Introducing the topic earlier in the session will allow more time for students to practice the tools and interpretations of linear regression. The topic should be introduced to the students no later than the second week of the session.
3. **Run team projects that require linear regression to be used by students.** The class project this past semester involved developing a measurement scale for the United Way of the Greater Lehigh Valley. This was a good project that met other learning objectives for the class. However, the project did not further the objective of students learning to use linear regression. A project should be identified that will require students to apply linear regression to a specific problem from a sponsoring organization. The project will allow students to work through a research project by defining a question, gathering data, cleaning and preparing data, running a linear regression analysis, interpreting results, and, finally, drawing conclusions about the data for the sponsoring organization. Such a project will touch on many aspects of a business research project, including ethical issues while allowing students to apply linear regression to a real-world problem.

## Appendix

## Regression Analysis (1)

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Criteria	Ratings				Pts
Model Displayed The resulting model is fully displayed; showing the error term is not required.	5.0 pts Full Marks	0.0 pts No Marks			5.0 pts
Data Described (Method - Participants, Source, Descriptives) The description of the data set is provided and is thorough. The description includes identification of participants, if they exist, of transactions, or of the relevant unit of analysis. Description is not just prose but includes relevant descriptive statistics.	5.0 pts Full Marks Data is fully and thoroughly described so that the reader could reproduce the relevant data set and test whether the reproduced data set is equivalent to that used in the problem.	4.0 pts Most Marks Description is useful and represents the data set but leaves out useful information for reproducing it.	3.0 pts Partial Marks Ambiguous and vague description of the data. Unclear description. Lacks descriptive statistics.	0.0 pts No Marks Data is not described.	5.0 pts
Procedure The procedure, including how the data was collected, is provided. Relevant construct definitions are included as are needed descriptions of the data items.	5.0 pts Full Marks Given available information, the procedure fully explains what data was collected and how the data was collected.	4.0 pts Most Marks The procedure description was not complete given the available information but did provide some description of the process.	3.0 pts Partial Marks The procedural description was vague and ambiguous, even unclear.	0.0 pts No Marks Procedure not described.	5.0 pts
Results Description of results follows APA style and includes the relevant statistics and results related to interpretation and significance for prediction.	5.0 pts Full Marks APA style for results followed completely, including required statistics and interpretation.	4.0 pts Most Marks Results described but not fully; some information left out though replication would still be possible.	3.0 pts Partial Marks Results described but description is vague or leaves out information. Replication of the work would be difficult.	0.0 pts No Marks Results not described.	5.0 pts
Conclusion A paragraph summarizing the findings and stating a conclusion about the use and limits of the model's value for prediction. The paragraph is written without jargon and as a clear communication of results to that a manager not conversant in statistics would understand.	5.0 pts Full Marks The meaning of the model is provided and is accurate. The model's significance is discussed as is the fit of the model given the results and outputs. A judgement about the use of the model for prediction is given within the context of the data and the setting.	4.0 pts Most Marks The meaning of the model is provided though it is incomplete. Discussion of fit is missing information or is not fully supported by results.	3.0 pts Partial Marks The conclusions are weak, vague, unsupported, or poorly communicated. Material is missing from the conclusion.	0.0 pts No Marks Conclusion is missing or is poorly written so that it can't be understood.	5.0 pts
Total Points: 25.0					