

IE 375 Spring 2020 Case 1: Comments

General Comments:

We are happy with your performance. We believe the case more-or-less is a very realistic setting, and hence it is important that you understand how one should approach. Regardless of the grade you have received, it is crucial that you do not see this type of problems as “just some homework”. Below are comments which are probably applicable to any work you will perform as an engineer, as well as course assignments:

- 1) Computational work: You better use a spreadsheet or a program to compute similar things repeatedly. It is good to observe that most of you did. Very few of you looked very hesitant to use any such supporting tool – hard to imagine. Of course, when you use such a tool, you need to clearly describe the formulas you have used. This is what I did in this document which states the solution.
- 2) When you are working with numbers, make sure that you used a reasonable number of digits after the decimal point (and be consistent). The reason is obvious: The readers want to get an insight looking at the numbers and you need to facilitate their understanding by only presenting the more significant part. It is also important that you understand those numbers and realize any peculiarities (mostly computational errors).
- 3) If you are using a program, to submit a spreadsheet or a computer program output without any explanation is not acceptable, in general. Always think that there will be somebody in the future making use of it, and hence make sure that you always support possible future users. Of course, while writing the explanations, we think that you will learn yourself and catch your own errors, if any.

Further Comments:

- 1- There are many possible forecasting methods that we have not covered in the course. Hence, we did NOT expect you to include out-of-textbook approaches in your solutions. Of course, more sophisticated approaches may be viewed positively since they will require additional reading and work. But any group using only textbook methods could get full credit from the case, of course, if they applied those methods correctly.
- 2- Once the data structure is set, we expect students to outline possible forecast models and initialize the parameter values of each method using the training data. (It is also OK if you use more than one data structure and do the analysis for all.) We expect you to use initialization procedures available in the textbook that are consistent with forecast methods applied. You may also leverage those procedures to come up with similar (but still reasonable) initialization ideas.
- 3- Then, at the test stage, you should compare different forecasting methods as well as parameter values to find the best method and its parameter values. It is advisable to choose the parameter values from the ranges defined in the textbook. However, it is OK if you choose these values from larger ranges and compare your results for these values. Make sure that the resulting “optimal” parameter set is reasonable. There are alternative ways of computing MAD (by taking simple average or using smoothing). It is OK if you use any of these with some reasoning. Please note that the case also asks you to compute the forecast values for time periods where the data is not available (this part requires computation of multiple-step-ahead forecasts). Just to

refresh your memories, the following lines (written in *italics*) depict the question asked:

- *Consider different forecasting methods that are applicable for the given data.*
 - *Determine the initial parameter values of these methods based on the data available in the first 36 weeks.*
 - *Compare these forecasting methods by calculating the one-step-ahead forecast errors from week 37 through week 48. Use the MAD as the basis to compute forecast error.*
 - *Find the most appropriate method and its parameter values.*
- 4- For regular glasses, the case question is: “Analyze the data to determine an appropriate method for forecasting weekly demands.” Therefore, we expect you to work with aggregate demand values (weekly total) in your analysis for regular glasses.
- 5- You can see that there are different solutions, and hence the “Solutions” document reflects only one of them. This is what you will have in a real-life case, as there are many factors that you cannot control.
- 6- Regarding Forecasting: It was a bit unexpected to see several groups that could not respond part B) for each type of glasses. In other words, given your decision on how to forecast, it should be very straightforward to forecast – make sure that you can forecast given a model. In addition to forecasting the next period, we will see why it is important to be able to forecast the total demand over the lead-time (regular glasses) and total demand over a year (sunglasses) in the future topics of the course.

Notes on Grading:

Of course, grading will depend on how you have presented your results. If you have an inconsistency in presentation, even if you have the “correct” result, you might have some points deducted. The following structure gives roughly an idea on how your cases were graded.

- Regular glasses:
 - Data analysis: 5 points
 - Use of weekly total demand: 5 points
 - Two reasonable methods: 30 points (5 bonus points for each additional reasonable method and 10 bonus points in total at most)
 - Forecast questions: 10 points (full credit even if you have a “wrong” method before forecasting, but perform forecasting correctly – of course partial or no credit if none in this part)
- Sunglasses:
 - Data analysis: 5 points
 - Winter’s method: 30 points (5 bonus points for each additional reasonable method and 10 bonus points in total at most)
 - Forecast questions: 15 points (full credit even if you have a “wrong” method before forecasting, but perform forecasting correctly – of course partial or no credit if none in this part)

Final Note: Any objections in grading should be submitted by e-mail to the respective course instructor.