**Week 4: Lab (Application of Time Series Forecasting)**

Scenario/Summary:

In the realm of business, organizations are looking to make money and are also looking for ways to be the most efficient reducing cost so that profit margins continue to get better over time. Awareness of this is something we have all probably heard where time is money, so we have the need for time series forecasting and analysis. They are various forms of models that can help managers and leaders of organizations make a wide range of energetic managerial decisions successfully and are directly related, leading to predictions. In an uncertain world, we will make decisions knowing there are uncertainties, but knowing we have a history of data to work from, we can make good decisions with good anticipations.

1. Using a minimum of three academic sources of research, prepare a minimum of three pages covering the theory behind models of forecasting and predictions to work with casual forecasting and time series analysis. In the textbook, there are several models covered. Use these types of models as a focus of your research.
2. In the conclusion of this paper, you will reference and apply understanding, gathering feedback on various cases beginning with Step 3, while using models covered in the book and the FamilyHomePrices.xlsx data file. All data files associated with the book can be accessed through the website below.

Cengage Brain, (2016). Book data files: Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics. (7th ed.). Retrieved from <http://academic.cengage.com/resource_uploads/downloads/1285418689_404522.zip>. Files are available under Course Home 🡪 Course Resources.

1. Toward the end of Chapter 11, you will find the section *Questions and Problems.* For the purpose of gaining application skills, practice of time series forecasting, and prediction models, refer to questions 11 through 14. In this case, you will use the FamilyHomePrices.xlsx file to work with line graphs, determining where data are stationary or nonstationary, double moving averages, Holt’s method, and regression analysis.
2. Organize all work in one Microsoft Excel workbook. When initially opening the FamilyHomePrices.xlsx. document, create *four* additional worksheets and copy the initial data into each of the new worksheets. Below is the initial information provided in the FamilyHomePrices.xlsx data file.

|  |  |
| --- | --- |
| **Year** | **Avg Price** |
| 1 | $114,400  |
| 2 | $115,300  |
| 3 | $124,700  |
| 4 | $126,600  |
| 5 | $129,300  |
| 6 | $133,500  |
| 7 | $135,800  |
| 8 | $141,800  |
| 9 | $150,500  |
| 10 | $159,100  |
| 11 | $168,300  |
| 12 | $176,200  |
| 13 | $185,300  |

1. At this point, you will have *five* total worksheets with the information above from Step 4. At this point, rename your worksheets ideally following the naming scheme below.
	1. Q11—Line Chart
	2. Q12—Double Moving Average
	3. Q13—Holts Method
	4. Q14—Linear Data
	5. Q14—Quadratic Data
2. Now based on examples of these methods covered in the book, work through the problems. Based on output and results produced through the models, reflect in descriptive details correlating back to your research, on which model offers you the best information if you were actually working this problem in a real-life case having to make decisions based on the output.
3. Save both your assignment files in Microsoft Word and Excel, and name the files Week\_4\_Lab followed by your first and last initials. For example, the file name for John Doe would be Week\_4\_Lab\_JD.
4. Submit both the Microsoft Word and Microsoft Excel assignment files to the Week 4 Lab Dropbox.

**Week 4: Lab (Grading Rubric)**

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| --- | --- | --- |
| **Category** | **Description** | **Points Earned** |
| Topic Selection | The topic clearly identifies various casual forecasting and time series analysis techniques as instructed.  | 5/5 |
| Bibliography | The bibliography includes at least three references. References are authoritative and do not include anonymous authors. Web pages, if used, are clearly written by experts in the field (expert qualifications are given in the summaries). At least three references are peer-reviewed, scholarly papers. The bibliography is in APA format and is free of typographical, grammar, spelling, and formatting errors. | 5/5 |
| Paper: Formatting | The paper is in 12-point Times New Roman font, double-spaced, and includes a cover page, table of contents, introduction, body of the report, summary or conclusion, and references. The Final Paper conforms to APA format. | 5/5 |
| Paper: Organization and Cohesiveness | The paper includes an introduction that generates interest in the topic and previews the main points to be covered, a body that develops each main point, and a conclusion that summarizes the main points covered. There is a logical flow of ideas throughout the paper. There is a clear thesis statement for the paper and a clear topic statement for each major section. Appropriate transitions are used between topics and subtopics. | 5/5 |
| Paper: Editing | The paper uses a professional writing style and is free of typographical, spelling, and grammar errors. | 5/5 |
| Paper: Content | The paper is of the required length and fully addresses topics provided. Topic areas should include theory behind models of forecasting and predictions where supported to work with casual forecasting and time series analysis. Examples and supporting details are provided for each main point. Authoritative sources are cited as support. The paper is at least 80% in the student’s own words (i.e., no more than 20% direct quotations from a source). | 35/35 |
| Excel: Technology | Proper use of the FamilyHomePrices.xlsx data file is observed and demonstrated application and uses of line graphs determining where data is stationary or nonstationary, double moving averages, Holt’s method, and regression analysis. | 30/30 |
| **Total** | **A quality paper will meet or exceed all of the above requirements.** | **90/90** |
| **Comments** |  |