

# BUSINESS ANALYTICS: EXERCISE SHEET No.1 (WiSe2018-19)

**25TH OF OCTOBER (DUE 31ST OF OCTOBER AT  
23:59:59)**

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## QUESTION 1 TIME SERIES FORECASTING - 5 POINTS

(Type A questions are considered easy ones. Just be concise and answer directly the questions with no more than two phrases.)

- Time Series Forecasting can be used to help us write texts. How? What would be your time-series input  $y_1, \dots, y_T$ ? What would be your Forecast target  $\hat{y}_{T+1}$ ?
- Without copying the definition in the slides, what is the main difference between Seasonality and Trend? How are both different from a cycle?

## QUESTION 2 DATA CORRELATION - 8 POINTS

(Type B questions are procedural questions, where you should put your knowledge in practice. Pay attention and answer carefully.)

Consider the data-set below from a fake gaming platform where we can see how many games each user have, how much extra content they purchased and what was the highest play-time among all their games:

### DATA-SET

User	Games Owned	DLC Purchased	Highest Play-Time
#1	5	3	2
#2	4	2	4
#3	3	1	8
#4	6	4	1

Calculate the correlation between each variable

and explain the achieved values.

## QUESTION 3 - SEASONALITY AND AUTO-CORRELATION 7 POINTS

(Type B)

The time series below consists of rates of monthly milk production over 2 years. Each line represents one month starting in January:

Month	Production-Rate
1	2.112
2	1.932
3	2.162
4	2.13
5	2.227
6	2.124
7	2.184
8	2.152
9	2.062
10	2.121
11	2.03
12	2.091
1	2.109
2	1.996
3	2.173
4	2.163
5	2.233
6	2.142
7	2.182
8	2.129
9	2.138
10	2.215
11	2.156
12	2.212

Compute the auto-correlation. Do you see a seasonality? Plot the time-series and explain. Feel free to use code or excel for this answer.

### WARNING!

If we detect **Plagiarism** on your solution, you will receive no points for it. If a second plagiarism attempt is detected, you might fail the class or be expelled from your program.

You are allowed to discuss solutions, but if you

work on a group, you must indicate on your sheet with whom are you working with.

Group submissions earn 0 points.

### **BONUS POINTS!**

Submission grades represent 100% of this bonus. For each 11% of your total grade you will earn 0.5 bonus points on the final exam up to a maximum of 4 points.

### **HOW TO SUBMIT?**

Inside the Samelzonplatz Campus, there is a post-box cluster to the right corridor from the entrance. Look for the "Business Analytics Post-Box" (we will set it up on Monday). For security you must also submit on our learnweb page: <https://www.uni-hildesheim.de/learnweb2018/course/search.php?search=3108> (password: 3108). If you submit your physical version you will get it back with correction markings. Submitting on learnweb will guarantee that you will receive your grade (in case you forget to post it or it goes missing).

Keep in mind that your solution sheets are important documents, so make sure they are clean and organized. Non-readable sheets will not be graded.

WRITE YOUR NAME, ID, AND TUTORIAL GROUP.

REMEMBER TO KEEP A COPY OF YOUR SOLUTION FOR YOURSELF!