

STAT 2011: Workshop on Data Exploration and Technical Writing
2023-24 Term 2
Individual Assignment

Due: Week 8; Mar 10th, 2024 (Sunday) at 23:59

Total Score: 25% of Final Assessment

Please finish the assignment by yourself, you may use Excel and VBA to finish all the tasks.

Please upload All the File (Excel, and Excel with VBA) Via Blackboard System

Task 1: Please consider the sales record for Company A in the Excel File. Generate different kinds of graphs we have learned during the course with different variables. And please write about some of the findings/statements therein which you find interesting and useful based on each graph.

Requirement:

1. Please create different sheets for each graph and save them in the same Excel file.
2. At least 10 graphs should be generated.
3. For each finding/statement should be over 30 words.

Task 2: If we want to do some research and finding on the Poverty Situation in Hongkong, we can refer to the “Hong Kong Poverty Situation Report” proposed by census and statistics Department (<https://www.censtatd.gov.hk/en/EIndexbySubject.html?pcode=B9XX0005&scode=461>) from 2012 to 2020. The detailed datasets are attached named B9XX0005E2012AN12E01.xls to B9XX0005E2020AN20E01.xls. Please use **VBA Macros** to generate a summary Excel file which may show poor elders (aged 65+) population before policy intervention by District Council district.

Requirement:

1. You may find the poor elders (aged 65+) population number by district council in table Category 2: **Detailed poverty statistics before policy intervention** and the table named “**Socio-economic characteristics of poor population by District Council district.**”
2. The summary excel should contain a “total sheet” which may cover all District Councils and have 18 sperate sheets for the district council respectively.

	A	B	C	D	E	F	G	H
1		Central an	Wan Chai	Eastern	Southern	Yau Tsim I	Sham Shui	Kowloon (Wc
2		2012						
3		2013						
4		2014						
5		2015						
6		2016						
7		2017						

	A	B
1		Central an
2		2012
3		2013
4		2014
5		2015

total	Central and Western	Wan Chai	Eastern	Southern	Yau
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3. All the steps including opening/closing files, locating the corresponding table/number and copying/pasting the number to the summary files should be done by the VBA Macros.

Task 3: Please generate a public function in VBA Macros which may help us to find the most appropriate α (evaluated by forecast error: MAE or MSE) in Exponential Smoothing. And applied it to the Excel file generated in Task 2.

$$\begin{aligned}\hat{y}_t &= \alpha y_{t-1} + (1 - \alpha) \widehat{y_{t-1}} & 0 \leq \alpha \leq 1 \\ &= \alpha y_{t-1} + \alpha(1 - \alpha)y_{t-2} + \dots \\ &= \alpha[y_{t-1} + (1 - \alpha)y_{t-2} + (1 - \alpha)^2 y_{t-3} + \dots]\end{aligned}$$

Requirement:

1. The function should have 2 parameters, one is for loading the data, and the other one should be a Boolean (True for MAE, and False for MSE).
2. The “most appropriate” means that the corresponding α can get the minimal value of MAE or MSE. α should have two decimal places.
3. Please try to apply this function to 18 District councils district respectively in Task 2 by another VBA Macros.

-End of the Individual Assignment-