Market Risk Analysis.  Overview The task you are given is to estimate the market risk for a hypothetical holding of 1,000,000 WBC shares, held on March 3, 2022 (you are working out the risk position assuming that you own these shares at the open of trading that day). You will do this by estimating the Value-at-Risk for the stock using historical data. Description You will be asked to calculate the following; - 10 day VaR for the portfolio of shares at a confidence level of 99%. Note: This risk estimate applies to the next 10 trading days from March 4, 2022 until March 17, 2022 (i.e. – it should be a forecast of risk). Based on what you have learnt you realized that you have several options for how to compute this risk measure. You are considering using a VaR based on a) the normal distribution using a 250-day rolling window, b) the normal distribution using a 63-day rolling window, c) the normal distribution using the EWMA (lambda = 0.94), d) historical simulation based on a window of 250 days, or e) historical simulation based on a window of 63 days. To aid in the decision of which to use, you are going to consider the recent historical performance of the five models in calculating 1 day VaR at the confidence level of 99%. You will do so by first examining the frequency of instances when the VaR was exceeded by the observed return using the last five years of data. You will then evaluate the appropriateness of these frequencies over time relative to the Basel traffic light levels discussed in lectures. Based on this performance, and any other factors you want to discuss, select the best model and report the required VaR(10, 99%) for March 3, 2022. Presenting your results - You are to conduct your analysis in a copy of the Excel file “Assignment\_Part\_A – Data and Results.xlsx” provided on Blackboard. This file contains a tab with the raw for historical WBC share prices as well as a front page for you to summarize your results. All working is to be contained in the subsequent tabs. - The front tab asks you to provide the following o Your name and Student number o The exceedance probabilities for the five models above. o A graph summarizing the Basel Traffic Light results over time (such as the one shown in Lecture 3). o Which of the models above is your preferred model based on the backtesting results? o The final VaR(10,99%) for the stock based on your preferred model. o An evaluation of the relative performance of the five models and a clear justification of which model is superior based on your backtesting. This is essentially a discussion of how you should interpret the backtesting results in order to select the most appropriate model. This should be no more than 300 words. - Your excel file should be formatted in a reasonably clear way, so that someone who was given the same job after you would be able to understand your working and replicate what you have done. Additional Notes and Instructions - For the backtest, you will start with the five years of data specified above when you begin your analysis. This is does not mean that you will have five years of VaR numbers and exceedances to compare (you will have less than this). That is ok, you only need to use the data specified. - You should initialise your EWMA using the sample variance of the first 250 daily returns. - In order for your backtesting to constitute a fair comparison, you should examine exceedances over the same days across all five models. - Your excel spreadsheet must contain the formulas that you have used for all calculations (i.e. – don’t paste the values for the calculations). - There is an Excel file available on blackboard (called “Excel guide.xlsx”) that includes instructions for how to do several useful things in excel. It also includes some informative examples which might be of interest. Please look at this file.