



Level 4 Cert in Statistics for Data Science (949) 156 Credits

Unit: Measures of Central Tendency	Guided Learning Hours: 260
Exam Paper No.: 4	Number of Credits: 26
Prerequisites: Mathematical terms and Excel knowledge.	Corequisites: A pass or higher in Certificate in Excel or equivalence.
Aim: Measures of Central Tendency are an important part of statistics. Central tendency refers to the middle typical value of a set of data, and is most commonly measured by using the three Ms: mean, median, and mode. The mean, median, and mode are known as the measures of central tendency. Mean is the arithmetic average, Median is the middle value when data is ordered and Mode is the most frequent value. In addition to median, mode, range, 1st Quartile, 2nd Quartile (Median), 3rd Quartile and Inter Quartile Range (IQR) statistical formulas and equations, the course will cover geometric mean, harmonic mean and Root Mean Square (RMS). Other formulas covered are Sample Standard Deviation, Population Standard Deviation, Sample Variance, Population Variance, Coefficient of Variation and Mean Absolute Deviation. Learners also learn how to find the Weighted Mean (Weighted Average).	
Required Materials: Recommended Learning Resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: The unit requires a combination of lectures, demonstrations, discussions, and hands-on labs.	
Intended Learning Outcomes: 1. Understand how mastering statistics requires a solid grasp of measures of Central Tendency formulas to help identify the centre of a dataset. 2. Understand the process of calculating median (middle value) of a dataset using a formula if data set has odd or even number values. 3. Understand the formulas and steps to find range, midrange and coefficient of range metrics. 4. Understand the process of finding a missing value given the Mean; including the way to double-check if calculation is correct. 5. Understand the importance of weighted mean in assigning varying degrees of importance or frequency to certain factors.	Assessment Criteria: 1.1 Be able to calculate Sample Standard Deviation (s). 1.2 Demonstrate calculating Population Standard Deviation (σ). 1.3 Be able to calculate Sample Variance (s^2). 1.4 Demonstrate calculating Population Variance (σ^2). 1.5 Be able to calculate Coefficient of Variation or Coefficient of variance (CV). 1.6 Demonstrate calculating Mean Absolute Deviation. 2.1 Describe the process of calculating Mean, Median, Mode and Range. 2.2 Be able to calculate Mean using Odd Values Formula. 2.3 Demonstrate calculating Mean using Even Values Formula. 2.4 Describe why calculating Mean is important. 2.5 Explain the difference between calculating the mean from range vs frequency table. 3.1 Describe Range, Midrange and Coefficient of Range. 3.2 Describe the formulas in calculating Range, Midrange and Coefficient of Range. 3.3 Demonstrate calculating range. 3.4 Be able to calculate mid range. 3.5 Demonstrate calculating mid-range. 4.1 Explain the use of Mean in continuous data. 4.2 Define normally distribution. 4.3 Describe parts of the Mean formula. 4.4 Describe the processing of finding missing value given the mean 4.5 Demonstrate double checking the processing of finding missing value given the mean. 5.1 Define weighted mean. 5.2 Demonstrate using the weighted mean formula. 5.3 Describe the use of weights.

6. Understand the other different Mean Formulas such as arithmetic mean, geometric mean, harmonic mean and Root Mean Square (RMS).	5.4 Describe the difference between weighted mean and arithmetic mean. 5.5 Describe common types of weights and how weights (weighted mean) work. 6.1 Describe different statistical data terms. 6.2 Demonstrate calculating arithmetic mean (average). 6.3 Be able to calculate geometric mean. 6.4 Describe finding geometric of multiple numbers. 6.5 Demonstrate calculating harmonic mean. 6.6 Be able to calculate harmonic mean of multiple data points. 6.7 Describe Root Mean Square (RMS)
Methods of Evaluation: A 2-hour written examination paper with Section A and Section B. Section A has 40 multiple choice questions. Section B has three essay questions, each carrying 20 marks. Candidates are required to answer all questions. Candidates also undertake project/coursework in Measures of Central Tendency with a weighting of 100%.	

Recommended Learning Resources: Measures of Central Tendency

Text Books	• Measure of Central Tendency and Dispersion (with Solved Problems) by R. Suguntha Kunthalambigai & R. Brimapureswaran. ISBN-10 : 9358875917 • Tornado Chasers: Measures of Central Tendency (Mathematics in the Real World) by Christine Dugan. ISBN-13 : 978-1433334634 • Central Tendency (Psychological Insight) by Mehar Bharadwaj. ISBN-13 : 979-8410207584
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	Excel