Module 2: Quantitative Reasoning Techniques
Module 2 Tutorial: Basics of Quantitative Reasoning

In this tutorial activity, students will learn the basic Quantitative Reasoning Techniques to perform the data analysis.

Intended Learning Outcomes

Number	Description
ILO-1	Digital Competencies & Problem Solving: Select digital tools and techniques based on their strengths and limitations and use them on given data for problem solving and decision making.
ILO-2	Digital Competencies & Problem Solving: Collect and organize relevant data for analysis.
ILO-3	Digital Competencies & Problem Solving: Apply quantitative reasoning to analyze data to guide problem solving and decision making.

Lesson Overview

In the two weeks of module 2 activities, the students will learn the step-by-step Quantitative Reasoning methods involved in performing data analysis. Upon completion of the lesson, students will be able to apply quantitative reasoning techniques to analyze data to support decision-making.

Activity 1: Data Collection

Each group will perform the data collection by following the instructions given below.

Instructions:

a. Each group to collect the Government Budget and Fiscal Position, Annual dataset from: NTULearn or the link given below https://beta.data.gov.sg/collections?query=Government%20Budget%20and%20Fiscal%20Position%2C%20Annual
b. To perform the next activities, first you need to study and understand the data you have received. What information/details are collected, the parameters used to collect those details, and meaning of numerical data collected – understand the data collected in each column.

Activity 2: Data Plotting and Analysis

Each group to understand one digital tool (Microsoft Excel) and its basic techniques to use them on collected data for analysis and decision making. Follow the instructions given below.

Data Plotting

Instructions: Using data from government-total-expenditure.csv to answer the following questions:

a. A bar chart presenting the expenditure incurred by all the ministries during the period from 1997 to

2021.

b. A line chart presenting the expenditure incurred by the Ministry of Transport during the period from 1997 to 2021.
c. A pie chart presenting the expenditure incurred by the sectors during the period from 19197 to 2021.

Data Analysis

Instructions: Using data from government-total-expenditure.csv to answer the following questions:

a. What was the total annual expenditure incurred for the Ministry of Education during the period from 1997 to 2021?
b. What was the total amount of Operating Expenditure during the period from 1997 to 2021?
c. Which sector and ministry had incurred the higest expenditure? When did this occur?
d. What is the average expenditure during the period from 1997 to 2021?

Activity 3: Reflection

Discuss and submit the reflection by your group on this tutorial.

a. Which part of the data plotting and analysis were difficult and challenging? How did your group overcome this challenge?
b. How do you think this data analysis could be useful in real life or in your area of study?
c. Do you think, any digital tools other than Excel could be used for data analysis? If yes, name them?

Each group need to write your answers to activity 3 questions in a word document/power point slides named as "TutorialNumber_GroupNumber_WeekNumber" and upload it in Discussion page of your tutorial site.

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