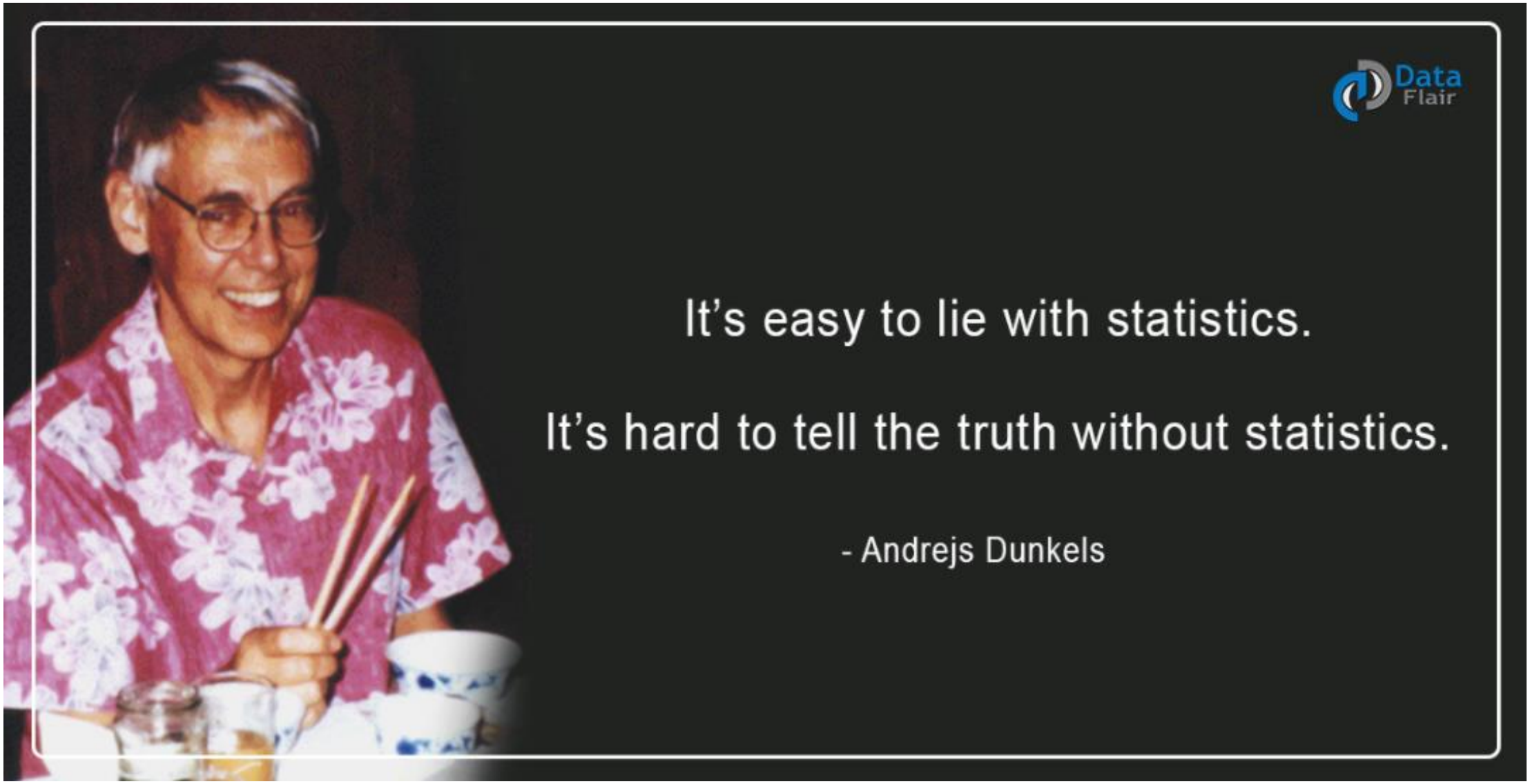
Data Flair
It’s easy to lie with statistics.
It’s hard to tell the truth without statistics.
- Andrejs Dunkels

PBD-1801
Statistical Methods

Unit 1

Session 1

05/07/2024

Statistics

- Every minute of the working day, decisions are made by businesses around the world that determine whether companies will be profitable and growing or whether they will stagnate and die.
- Most of these decisions are made with the assistance of information gathered about the market place, the economic and financial environment, the workforce, the competition and other factors.
- Such information comes usually in the form of data or is accompanied by data.
- Statistics provides the tool through which such data are collected, analyzed and summarized and presented to facilitate the decision making process.
- For eg. a survey of 477 executives by The Association of Executive Search Consultants determined that 48% of the men and 67% of the women say they are more likely to negotiate for less business travel compared with five years ago.

Basic Statistical Concepts

- Population: A collection of persons, objects or items of interest.
- The population can be a widely defined category such as “all automobiles” or it can be narrowly defined such as “all Ford cars produced from 2016-2018”. A population can be a group of people such as “all workers presently employed by Microsoft”, or it can be a set of objects such as “all dishwashers produced on July 31,2018” by a specific manufacturing company.
- When a researcher gather data from the whole population for a given measurement of interest, it is called Census.

- Sample: A sample is a portion of the whole and is a representative of a whole population. Researchers often prefer to work with sample instead of entire population.
- For example, to conduct a quality control experiment to determine the average life of light bulbs, a light bulb manufacturer might randomly sample say 75 light bulbs during a production run. A HR manager may take a random sample of only 10 employees instead of taking a whole employees to save time and money.
- Descriptive Statistics: if a business analyst is using data gathered on a group to describe or reach conclusions about that same group, the statistics are called Descriptive.
- Inferential Statistics: If a researcher gathers data from a sample and uses the statistics generated to reach conclusions about the population from which the sample was taken, it is inferential statistics.
- One application of inferential statistics is in pharmaceutical research.

Parameter and Statistic

- A descriptive measure of the population is called a parameter. Parameters are usually denoted by Greek letters. Examples of parameters are Population mean (μ), Population variance (σ^2), and Population standard deviation (σ).
- A descriptive measure of a sample is called a Statistic. These are usually denoted by Roman letters. Examples of Statistic are sample mean ($\bar{X}$) , sample variance (s^2) and sample standard deviation(s).
- A analyst often wants to estimate the value of a parameter or conduct test about a parameter. However the calculation of parameters usually either impossible or infeasible because of the amount of time and money required to take a census. In such cases, a business researcher can take a random sample of the population , calculate a statistic on the sample and infer by estimation the value of the parameter.