



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

CREATE CHANGE

# ECON1310

## Introductory Statistics for Social Sciences

### Tutorial 1: DESCRIPTIVE STATISTICS I

Tutor: Francisco Tavares Garcia

# Who's your Tutor?

Born in 1986 in Ourinhos /  
São Paulo state, Brazil

2004 – 2008

Bachelor of Computer Science

2008 – 2012

Supervisor at Procter & Gamble

2009 – 2011

MBA - FGV

2012 – 2018

Built and ran a Hostel

2018

Moved to Australia

2021 – current

Bachelor of Economics - UQ

## Statistics/Econometrics:

**ECON1310** - Introductory Statistics for  
Social Sciences

**ECON2300** - Introductory  
Econometrics

**ECON2105** - Statistical Theory for  
Economists

**ECON3350** - Applied Econometrics for  
Macroeconomics and Finance

**STAT2003** - Mathematical Probability


**STAT2004** - Statistical Modelling &  
Analysis





# How to watch lectures? Can I attend a lecture?


▼ [ECON1310] Introductory Statistics for Social Sciences (external). Summer Semester, 2022 (ECON1310S\_7280\_80111)


- Announcements
- Course Profile (ECP)
- Course Staff
- Course Help
- Learning Resources**
- Assessment
- Discussion Board
- My Grades
- Library Links







 **Lecture 1 - Descriptive Statistics I**  
Lecture 1 PowerPoint slides and videos.

 **Lecture 2 - Descriptive Statistics II**  
Lecture 2 PowerPoint slides and videos.

 **Lecture 3 - Probability I**  
Lecture 3 PowerPoint slides and videos.


 **Lecture 4 - Probability II**  
Lecture 4 PowerPoint slides and videos.

 **Lecture 1.1 Introduction**

Attached Files:  Lecture 1 (3 slides per page).pdf (575.46 KB)   
 Lecture 1 (6 slides per page).pdf (564.137 KB)   
 Lecture 1 (1 slide per page).pdf (641.654 KB) 

lecture 1.1 what is statistics v3.mp4 (03:04)

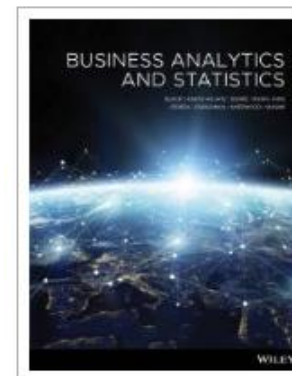
Descriptive statistics I  
What is statistics?



## Books we're following

### Australasian Business Statistics (Wiley, 4th edition)

by Black, Asafu-Adjaye, Burke, Khan, King, Perera, Papadimos, Sherwood & Wasimi.



### Business Analytics and Statistics

Ken Black

#### Availability

Your institution has access to 6 copies of this book.



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Cite Book

#### Description

Currently not available for this book.

Table of Contents

# How to complete this course?

Assessment Task	Due Date	Weighting	Learning Objectives
<i>CML Quiz 1</i> Descriptive Statistics	07 Dec 22 9:00 - 12 Dec 22 16:00 2nd attempt: 14-16 Dec 2022, 09:00-16:00	8%	1, 2, 3, 4, 5
<i>CML Quiz 2</i> Probability	14 Dec 22 9:00 - 19 Dec 22 16:00 2nd attempt: 21-23 Dec 2022, 09:00-16:00	8%	1, 2, 3, 4, 5
<i>Online Quiz</i> LBRT #1	03 Jan 23 9:00 - 04 Jan 23 16:00 2nd attempt: 5-6 Jan 2023, 09:00-16:00	20%	1, 2, 3, 4, 5
<i>CML Quiz 3</i> Normal and Sampling Distributions	04 Jan 23 9:00 - 09 Jan 23 16:00 2nd attempt: 11-13 Jan 2023, 09:00-16:00	8%	1, 2, 3, 4, 5
<i>CML Quiz 4</i> Confidence Intervals	11 Jan 23 9:00 - 16 Jan 23 16:00 2nd attempt: 18-20 Jan 2023, 09:00-16:00	8%	1, 2, 3, 4, 5
<i>Online Quiz</i> LBRT #2	17 Jan 23 9:00 - 18 Jan 23 16:00 2nd attempt: 19-20 Jan 2023, 09:00-16:00	20%	1, 2, 3, 4, 5
<i>CML Quiz 5</i> Hypothesis Testing	18 Jan 23 9:00 - 23 Jan 23 16:00 2nd attempt: 25-27 Jan 2023, 09:00-16:00	8%	1, 2, 3, 4, 5
<i>CML Quiz 6</i> Simpler Linear Regression	25 Jan 23 9:00 - 06 Feb 23 16:00 NO SECOND ATTEMPT	8% (Best 5 of 6 CML quizzes. See Section 5.4)	1, 2, 3, 4, 5
<i>Online Quiz</i> LBRT #3	07 Feb 23 9:00 - 08 Feb 23 16:00 2nd attempt: 9-10 Feb 2023, 09:00-16:00	20%	1, 2, 3, 4, 5

But I heard there is an IVA... (Identity Verified Assessment)



# What is the Identity Verified Assessment (IVA) process?

## Overview of student Identity Verified Assessment (IVA) process.

**Purpose:** Regular attendance and active participation during tutorials helps support your learning. It also allows tutors to get to know you, which in turn helps them to monitor and compare your *observed* tutorial performances with your *actual* assessment results (CMLs, LBRTs). Importantly, it also allows tutors to identify struggling students so that additional support can be provided. Consequently, tutors are well placed at the end of the semester to help verify students' anticipated grades, providing a valuable means of maintaining academic standards.

**Summary of IVA Process:** At the end of the semester, you may be invited to attend a 15 minute **mandatory oral interview**. Typically, tutors will invite students who did not attend any (or many) tutorials and/or consultation sessions during the semester, thereby making it difficult to verify a student's *actual* assessment performance.

**What to do if you are invited to an interview:** The interview will be held with your tutor. It will include a series of questions requiring an oral explanation, or a brief written explanation, involving numerical calculations or theoretical concepts related to any lecture. **NOTE: if you have been actively engaging with your tutor during the semester, it will reduce the need to attend an interview.**

# How to complete this course?

To successfully pass ECON1310, a student needs to achieve all three of the following requirements:

1. Receive a **combined total assessment mark of at least 50 marks out of 100 marks** from their CMLs Quizzes (40 marks available) and LBRTs (60 marks available).
2. Receive at least **16 marks out of 40 marks** from their **best 5 out of 6 CML Quizzes** (each being worth 8 marks).
3. Receive at least **24 marks out of 60 marks** from their **LBRTs** (each being worth 20 marks).

In determining a student's final overall grade for the course, the following will apply:

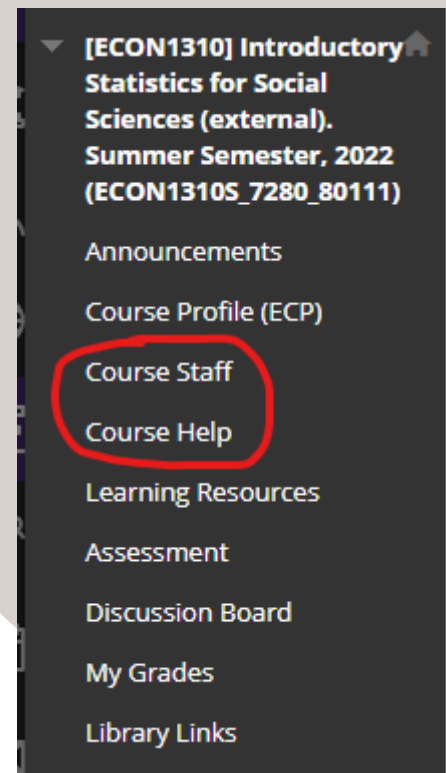
- If the CML Quizzes aggregate final mark is **less than** 16/40 **and** the LBRTs aggregate final mark is **less than** 24/60, the maximum possible grade will be 2.
- If the CML Quizzes aggregate final mark is **less than** 16/40 **or** the LBRTs aggregate final mark is **less than** 24/60, the maximum possible grade will be 3.

Details regarding the two assessable items (CML Quizzes and LBRTs) are outlined below.

# I need HELP!!!

- [d.byrne@uq.edu.au](mailto:d.byrne@uq.edu.au) – for academic or administrative questions.
- [cml.1310@uq.edu.au](mailto:cml.1310@uq.edu.au) – for CML quiz administration.
- Consultation every weekday!! (Mostly afternoon)

TIME	MON	TUE	WED	THU	FRI
10:00-10:30					
10:30-11:00					
11:00-11:30					
11:30-12:00					
12:00-12:30					<b>DOMINIC (12pm – 1pm)</b> <a href="https://uqz.zoom.us/j/5207526654">https://uqz.zoom.us/j/5207526654</a>
12:30-13:00					
13:00-13:30		<b>BEN (1pm – 2pm)</b> <a href="https://uqz.zoom.us/j/7884658078">https://uqz.zoom.us/j/7884658078</a>	<b>PETER (1pm – 3pm)</b> <a href="https://uqz.zoom.us/j/84419335972">https://uqz.zoom.us/j/84419335972</a>	<b>BEN (1pm – 2pm)</b> <a href="https://uqz.zoom.us/j/7884658078">https://uqz.zoom.us/j/7884658078</a>	
13:30-14:00					
14:00-14:30					
14:30-15:00					
15:00-15:30					
15:30-16:00					
16:00-16:30	<b>FRANCISCO (4pm – 5pm)</b> <a href="https://uqz.zoom.us/j/3181814065">https://uqz.zoom.us/j/3181814065</a>		<b>FRANCISCO (4pm – 5pm)</b> <a href="https://uqz.zoom.us/j/3181814065">https://uqz.zoom.us/j/3181814065</a>		
16:30-17:00					





**ECON1310**  
**Tutorial 1 – Week 2**

**DESCRIPTIVE STATISTICS I**

At the end of this tutorial you should be able to

- Define basic statistical concepts.
- Discuss the different categories of data.
- Outline the difference between descriptive statistics and inferential statistics
- Discuss several sampling methods and associated errors.

- Q1.**
- a) What is statistics? Explain the difference between descriptive and inferential statistics. Explain why inferential statistics is not required if we have a census.
  - b) Define: population, sample, parameter, and statistic.

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## Defining the subject of statistics?

- a branch of mathematics dealing with the analysis and interpretation of data.

### Descriptive Statistics

- used to organise, explore, summarise or describe collected data.
- used to present and make sense of data (visually using histograms, pie charts etc.)
- typically needs data to be collected (eg: survey), presented (eg: graph), and characterised (eg: using terms like average).

Example of unorganised data where descriptive statistics could help bring meaning to the data:

24,26,25,33,31,39,28,36,25,34,25,29,41,36,35,27

### Inferential statistics

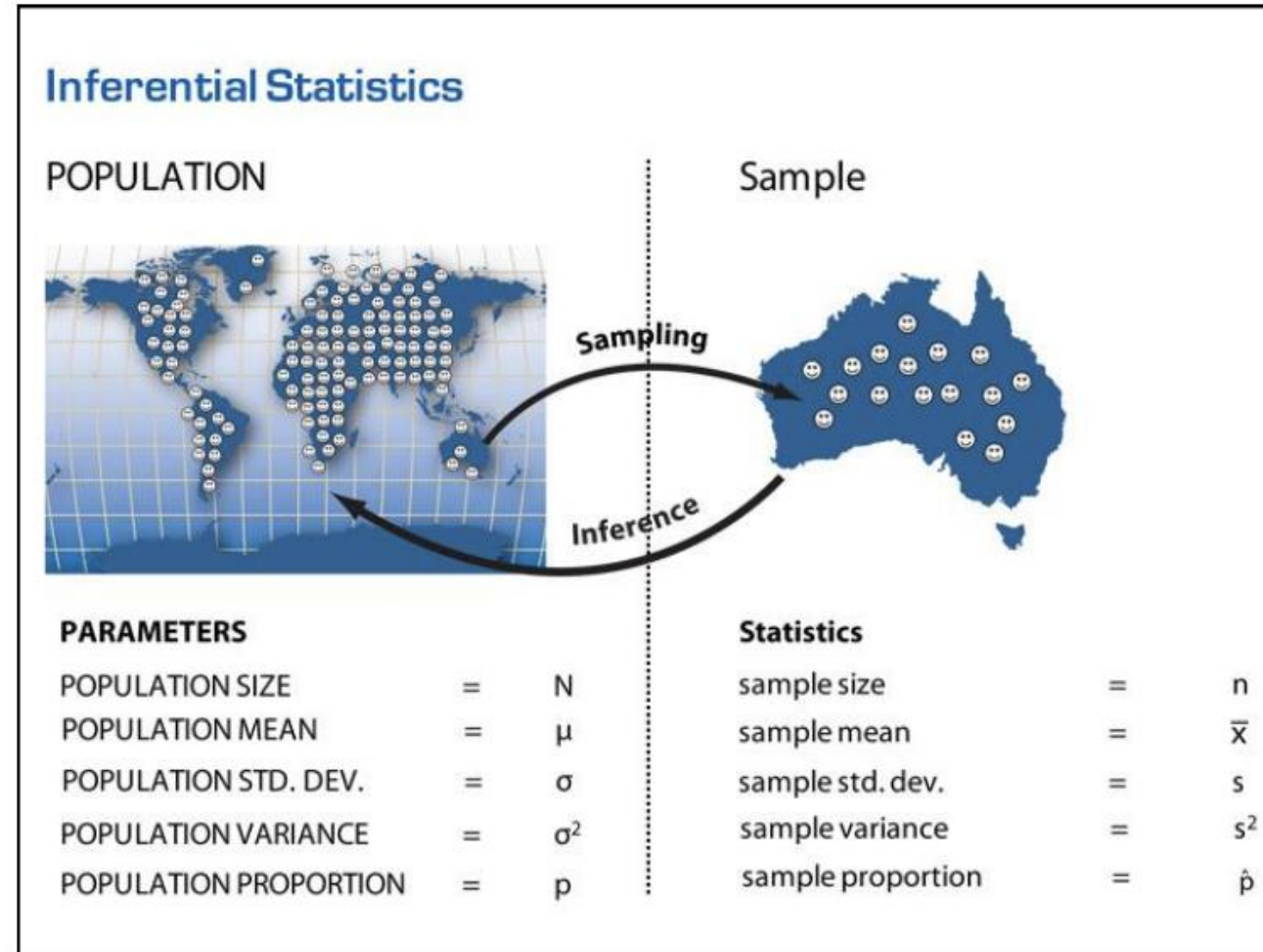
**= the main focus of ECON1310**

- **drawing conclusions** about a much larger population by examining a smaller, representative sample, that is taken from the population.
- requires a **systematic set of rules** be followed.

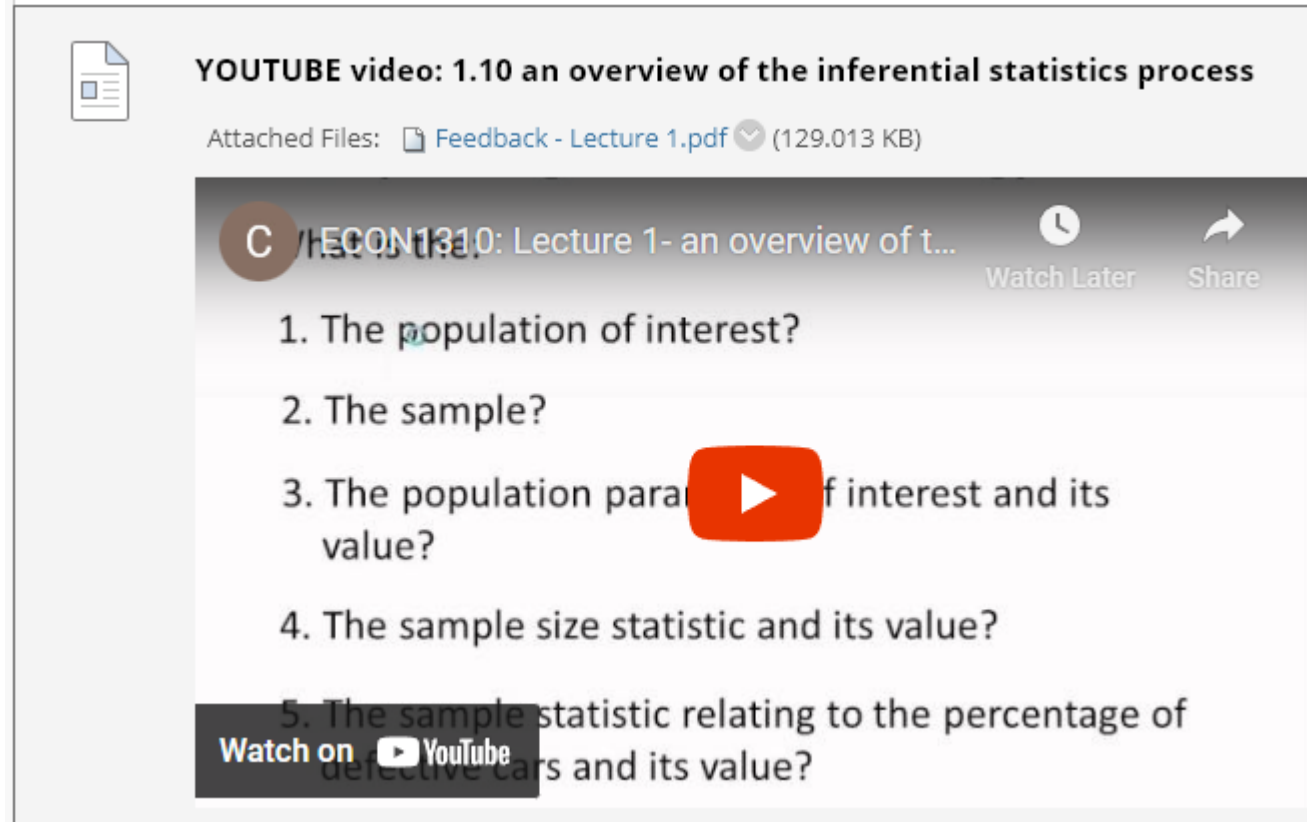
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**YOUTUBE video: 1.10 an overview of the inferential statistics process**

Attached Files:  Feedback - Lecture 1.pdf (129.013 KB)

**ECON1310: Lecture 1- an overview of t...**

Watch Later Share

1. The population of interest?
2. The sample?
3. The population parameter of interest and its value?
4. The sample size statistic and its value?
5. The sample statistic relating to the percentage of defective cars and its value?

Watch on YouTube

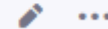
<https://youtu.be/iVn8IbQVZUg>

- Q2.** a) A manufacturer of mint lollies claims that less than 10% of his product is defective. When 1,000 lollies were drawn from a large production run, 7.5% were found to be defective. What is: the population of interest? the sample? the value of the parameter? the value of the statistic?
- b) A large company wanted to determine client satisfaction with their products and services. The Director of Marketing developed a questionnaire that yields a satisfaction score between 10 and 50 for participant responses. A random sample of the company's 900 clients is asked to complete a satisfaction survey. The satisfaction scores for the 35 participants are averaged to produce a mean satisfaction score. What is the population for this study? the sample? the statistic? What would be a parameter for this study?

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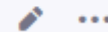
- ☐ 1000 lollies; large production run; 10%; 7.5%
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i) large production run   ii) 1000 lollies   iii) 10%   iv) 7.5%



b) A large company wanted to determine client satisfaction with their products and services. The Director of Marketing developed a questionnaire that yields a satisfaction score between 10 and 50 for participant responses. A random sample of the company's 900 clients is asked to complete a satisfaction survey. The satisfaction scores for the 35 participants are averaged to produce a mean satisfaction score. What is the population for this study? the sample? the statistic? What would be a parameter for this study?

(Poll)

b) A large company wanted to determine client satisfaction with their products and services. The Director of Marketing developed a questionnaire that yields a satisfaction score between 10 and 50 for participant responses. A random sample of the company's 900 clients is asked to complete a satisfaction survey. The satisfaction scores for the 35 participants are averaged to produce a mean satisfaction score. What is the population for this study? the sample? the statistic? What would be a parameter for this study?

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- ☐ 35 participants, 900 clients, satisfaction (35 part), satisfaction (900 cli)
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**b)** population is 900 clients of the company  
sample is 35 participants  
statistic is the mean satisfaction score from the 35 participants  
parameter would be the average satisfaction score for all the 900 clients

- Q3.** Coca-Cola and Pepsi display intense competition in their marketing campaigns featuring TV stars, rock videos, endorsements by well-known athletes etc. Suppose, as part of a Pepsi marketing campaign, 1000 [cola] consumers are given a blind taste test (i.e. a taste test in which the two brand names are not recognizable by the participants). Each consumer is asked to state a preference for Brand A or Brand B. Describe the population, the variable of interest, the sample and the inference.

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**Population:** all cola consumers

**Variable of interest:** proportions of consumers who prefer A to B

**Sample:** 1000 consumers given a blind taste test

**The inference:** To use the proportion we found in the blind test (sample) to **infer** something about the population.



- Q3.** Coca-Cola and Pepsi display intense competition in their marketing campaigns featuring TV stars, rock videos, endorsements by well-known athletes etc. Suppose, as part of a Pepsi marketing campaign, 1000 [cola] consumers are given a blind taste test (i.e. a taste test in which the two brand names are not recognizable by the participants). Each consumer is asked to state a preference for Brand A or Brand B. Describe the population, the variable of interest, the sample and the inference.

**Population:** all cola consumers

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**Sample:** 1000 consumers given a blind taste test

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infer

/ɪnˈfəː/

verb

deduce or conclude (something) from evidence and reasoning rather than from explicit statements.  
"from these facts we can infer that crime has been increasing"

Similar:

deduce

reason

work out

conclude

come to the conclusion



- Q4.** Explain the difference between a census and a sample survey. List 3 examples (for each part) where we rely on sample information rather than a census because:
- i) a census would be too expensive,
  - ii) the product is destroyed in the process of making the observation.

What other reasons are there for using sample data rather than census data?

**Q4.** Explain the difference between a census and a sample survey. List 3 examples (for each part) where we rely on sample information rather than a census because:

i) a census would be too expensive,

ii) the product is destroyed in the process of making the observation.

What other reasons are there for using sample data rather than census data?

**Q4.** Explain the difference between a census and a sample survey. List 3 examples (for each part) where we rely on sample information rather than a census because:

- A census will survey the whole population
- A sample survey will only survey part of the population (**the sample**)

i) a census would be too expensive,

- Market research to launch a new product.
- Election Polls.
- Everything that has a very large target audience.

ii) the product is destroyed in the process of making the observation.

- Tasting chips at the end of production.
- Testing the resistance of a brick.
- Quality assurance in a manufacturing line,

What other reasons are there for using sample data rather than census data?

- Not enough time to census the population.
- Data availability (secondary data).
- Ethical reasons (drug testing).

**Q5.** a) For each of the following random variables,

- (i) determine whether the variable is categorical or numerical (then continuous or discrete);
  - (ii) determine whether the variable is nominal, ordinal, interval, or ratio.
- a. the amount of money you spent buying clothes last month (to the nearest whole dollar).
  - b. the number t-shirts you own.
  - c. the job title of different employees in a large department store.
  - d. the time you spent shopping for clothes last month (in hours, to two decimal places).
  - e. when you go shopping for clothes during the week (eg: weekday, weeknight, weekend).
  - f. the type of transport you can use to go shopping.



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Numerical discrete	a. the amount of money you spent buying clothes last month (to the nearest whole dollar).	Ratio
Numerical discrete	b. the number t-shirts you own.	Ratio
Categorical	c. the job title of different employees in a large department store.	Nominal
Numerical continuous	d. the time you spent shopping for clothes last month (in hours, to two decimal places).	Ratio
Categorical	e. when you go shopping for clothes during the week (eg: weekday, weeknight, weekend).	Nominal
Categorical	f. the type of transport you can use to go shopping.	Nominal

b) Select the type of sample (SRS, Systematic, stratified, cluster) that has been formed in each survey.

i) The PPP company has 2000 employees. The CEO wants to investigate job satisfaction. The employees are numbered from 1 to 2000 and then 50 different random numbers are generated between 1 and 2000. A sample is formed by choosing the 50 employees whose numbers were generated.

ii) A small town has 10000 people who are investors in one way or another. The proportions are 1:3:6 for government bonds : real estate : stocks. To investigate investors' returns a researcher randomly selects 20 bond holders, 60 real estate investors and 120 stock investors to form a sample of 200.

iii) The CEO of PPP company decides to break the 2000 employees into 50 groups, each containing 40 employees. He selects randomly a number between 1 and 40 and selects the employee with this number. He then selects every 40<sup>th</sup> employee after this.

*(Which employees (numbered from 1 to 2000) would be chosen in (iii) if the randomly selected number was 35?)*

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SRS  
Simple Random Sampling

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Stratified

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Systematic

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35<sup>th</sup>, 75<sup>th</sup>, 115<sup>th</sup>... *(Which employees (numbered from 1 to 2000) would be chosen in (iii) if the randomly selected number was 35?)*

- Q6.** A company employs 3500 people and a random sample of 175 of these employees has been taken by systematic sampling. The researcher would start the sample selection between what two values? How would the researcher choose subsequent members of the sample? Where might the researcher obtain a frame for this study?

- Q6.** A company employs 3500 people and a random sample of 175 of these employees has been taken by systematic sampling. The researcher would start the sample selection between what two values? How would the researcher choose subsequent members of the sample? Where might the researcher obtain a frame for this study?

Decide on sample size (n) and calculate k:

$$k = N/n \quad (\text{round to nearest whole number if required})$$



**Q6.** A company employs 3500 people and a random sample of 175 of these employees has been taken by systematic sampling. The researcher would start the sample selection between what two values? How would the researcher choose subsequent members of the sample? Where might the researcher obtain a frame for this study?

Decide on sample size (n) and calculate k:

$$k = N/n \quad (\text{round to nearest whole number if required})$$

$$3500 / 175 = 20$$

The researcher would start the sample selection between 1 and 20.

After selecting the first member, the researcher would select the member who is 20 positions after the first one. This process would continue until 175 members are selected. (16<sup>th</sup>, 36<sup>th</sup>, 56<sup>th</sup>, etc.)

The researcher could have a list of employees by age, first name, or last name, sector, etc.

Decide on sample size (n) and calculate k:

$$k = N/n \quad (\text{round to nearest whole number if required})$$

Randomly select a starting point between 1 and k.

Select every kth individual after the starting point.

**ECON1310**  
**Tutorial 1 – Week 2**

**DESCRIPTIVE STATISTICS I**

At the end of this tutorial you should be able to

- Define basic statistical concepts.
- Discuss the different categories of data.
- Outline the difference between descriptive statistics and inferential statistics
- Discuss several sampling methods and associated errors.



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OF QUEENSLAND  
AUSTRALIA

CREATE CHANGE

# Thank you

## Francisco Tavares Garcia

Academic Tutor | School of Economics

[tavaresgarcia.github.io](https://tavaresgarcia.github.io)

### Reference

Black et al. (2016), Australasian Business Statistics, 4th Edition, Wiley Australia.