

# Introduction to Choice Modeling

Data Science, General Assemb.ly

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# AGENDA

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- Introduction to (applied) Choice Modeling
  - Learning how to leverage data & use predictive models
  - Takeaway: understand behavioral patterns & decision making process
- Discrete Choice Models
  - LPM – Linear Probability Model
  - Non-Linear Probability Models:
    - Logit (Log-Normal dist.)
    - Probit (normal dist.)
    - Nested-Logit
    - Random Coefficient (RD)
    - ....
- Practical Example
  - Motivation in Real-World Interface

# INTRODUCTION - MOTIVATION

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How can we explain changes and differences between the choices we make – everyday?

- ▶ Choices?:
  - ❖ Whether I decide to work (be employed), or not?
  - ❖ Whether I decide to purchase 2% milk vs. non-fat milk?
  - ❖ Whether a firm decides to adopt a new technology?
  - ❖ Whether I decide to get married?
  - ❖ Whether Apple should invest in a new feature (or improve a current one)?

*All of these are important everyday choices we want to understand*

# INTRODUCTION - MOTIVATION

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What can we do ?

- We can try to *understand how decisions are made* (what drives our decision to choose, behave, or act in a certain way..)
- We can try to *understand how different features/attributes affect* our decisions or our behavior

*We will be able to make recommendations, create strategy, and policies*

**Example:** Buy iPhone vs. Android?

How different attributes (e.g.: screen, design,..) or features (e.g.: Siri, Touch-Screen) affect our decision to buy an iPhone or other (Android)

*Seems to be important for manufactures, marketers, and developers*

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# MOTIVATION

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In order to answer these questions we need to **understand agents' behavior**

(e.g.: consumers, firms, policies)

→ we need to define and estimate **Choice Models** –Discrete (binary) or Continuous

- We will focus on Discrete Choice Models
  
- **Discrete Choice Models - A binary Choice:**
  - All of these questions deal with binary choices – 0 or 1 (notation: *outcome*  $\equiv y = (0,1)$ )
  - **Examples:**
    - ❖ Be employed, or not? →  $\text{emp}(0,1)$
    - ❖ Decided to purchase 2% milk or non-fat milk? →  $\text{milk2\%}(0,1)$
    - ❖ Firm decided to adopt a new technology? →  $\text{platform}(0,1)$
    - ❖ Get married? →  $\text{married}(0,1)$