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Data Preprocessing - Introduction

What is Data Preprocessing?

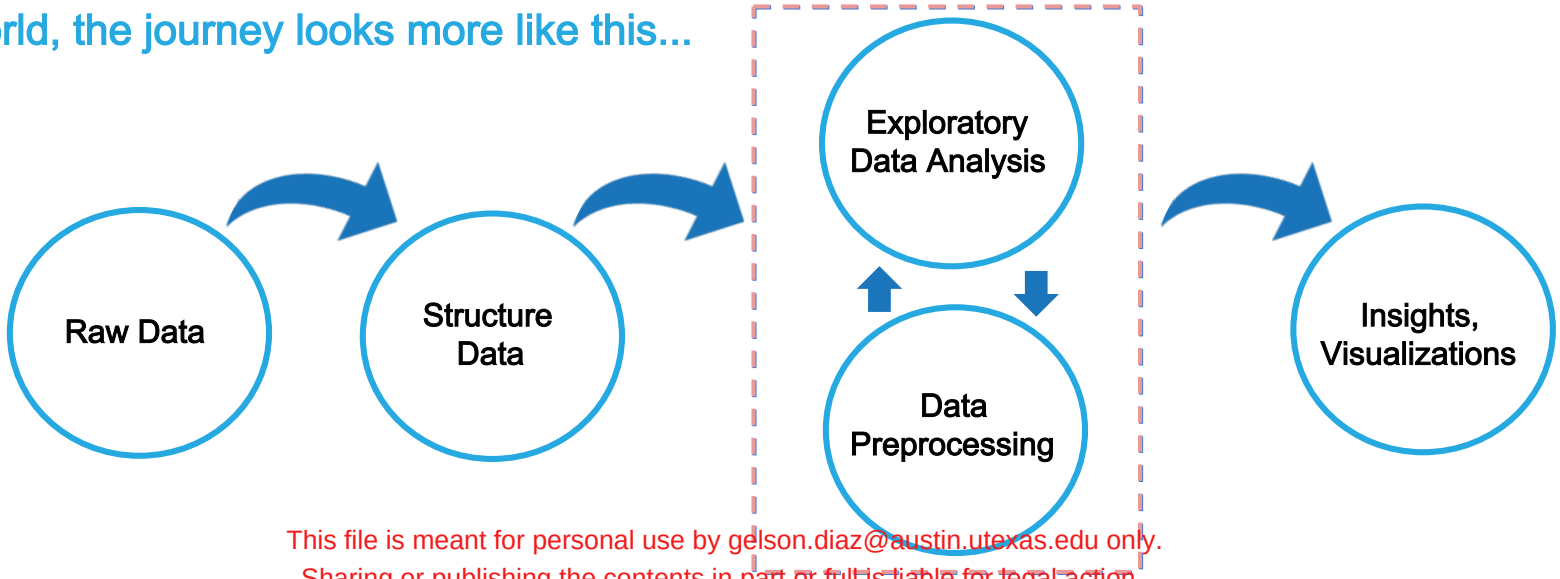
- Data preprocessing is a collective term used to describe a collection of approaches that help get the data ready for analysis
- It is the first step in the process of data analysis and goes by many different names like data cleaning/cleansing, data preparation, data scrubbing etc.
- This is generally very contextual and it requires good domain understanding to do this well

Why data preprocessing?

Real world data is messy

- It is often incomplete, inconsistent and has many other such fallacies
- This makes it inapt for any statistical analysis
  - It might lead to wrong insights
  - Decisions taken from this data can be counter productive for the organization
- So you can't directly go from data to insights

In real world, the journey looks more like this...



Broadly, the process can be thought of in these three steps

1

Data format checks

- data dimension
- data types

2

Data Consistency

- Missing values
- Extreme value / Outliers
- Distributions / Skewness

3

Feature Engineering

- Variable transformations
- Feature extraction

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Key Steps in Data Preprocessing

There are following key steps involved while doing data preprocessing:

a. Data inconsistency - check data dimension, data types
b. Check numerical and categorical data separately
c. Looking at the data distribution - generally the first thing you do in any analysis
    i. Missing values
    ii. Outliers / Extreme values
    iii. Skewness
    iv. Business sense check
d. Variable Transformations
    i. Encoding for Categorical variables - because some algorithms work only on numerical data
    ii. Scaling
    iii. Other transformations
e. Feature engineering - Creating new variables using domain knowledge