COMP 333 — Week 9 Models

Models

A *model* is a representation of some part of the real world.

A model is very simple compared to the whole real world.

Simple enough to understand and construct.
But not so simple that it is not useful
for whatever purpose you need the model.

We will look at how machine learning builds models in future lectures.

Here we introduce models, the different kinds of models,
and provide introductions to four common approaches:

- regression
- classification
- prediction
- simulation

Definition *Regression analysis* is a form of predictive modelling technique
which investigates the relationship between
a dependent (target) and independent variable (s) (predictor).
`https://www.analyticsvidhya.com/blog/2015/08/comprehensive-guide-regression/`

Definition *Classification* is the process of predicting the class of given data points.
Classes are sometimes called as targets/ labels or categories.
`https://towardsdatascience.com/machine-learning-classifiers-a5cc4e1b0623`

Definition *Predictive modeling* is a process that uses data and statistics
to predict outcomes with data models.
These models can be used to predict anything
from sports outcomes and TV ratings
to technological advances and corporate earnings.
https://www.microstrategy.com/us/resources/introductory-guides/predictive-modeling-the-c

Definition *Simulation* refers to the representation of a system or process
that is defined by known relationships.
Simulation, allows us to build a mathematical model of the world
and run it several times on a computer.
This allows us to evaluate various decisions and choose between them.
https://towardsdatascience.com/every-data-scientist-needs-to-read-these-simulation-stori

The *importance of simulation* is that it allows
parameters to be changed in the models
to understand *cause and effect*
at a level which is not possible in other ways.
It also permits phenomena to be studied
which might be too expensive or dangerous
for conventional experimental methods.
https://towardsdatascience.com/every-data-scientist-needs-to-read-these-simulation-stori

To become familiar with modeling,
it is worthwhile to read/watch the supplementary material.