**Topic 1: Generalized Linear Model (GLM), Generalized Additive models (GAM) and their application**

* Understand interpretable models
* Understand GLM and GAM
* Application to a case study

Resource:

* <https://towardsdatascience.com/generalized-linear-models-9cbf848bb8ab>
* Python Library: statsmodels

**Topic 2: Sequential covering and its application to a case study**

* Understand interpretable models
* Understand decision rules and sequential covering algorithm
* Apply sequential covering to a case study

Resource:

* Python Library: tool for decision tree + self-implement

**Topic 3: Layer-wise relevance propagation (LRP) and its application to a case study**

* Understand the definition of post-hoc methods
* Understand LRP
* Compute and apply LRP value to a case study

Remark:

* + some more programming effort using e.g. tensorflow are needed
  + No official implementations. Private implementations exist.

**Topic 4: Permutation feature importance and its application to a case study**

* Understand local and global post-hoc methods
* Understand feature importance and permutation feature importance
* Apply permutation feature importance to a case study and explain the result

Resource:

* Python Library: Skater, ELI5

**Topic 5: Partial Dependence Plot (PDP) and its application to a case study**

* Understand global and local post-hoc methods
* Understand the mathematical formulations of partial dependence
* Compute partial dependence and make PDP for a case study

Resource:

* Python Library: Skater, InterpretML

**Topic 6: Accumulated Local Effect (ALE) plot and its application to a case study**

* Understand global and local post-hoc methods
* Understand the mathematical formulation of ALE
* Compute ALE and make a plot for a case study

Resource:

* Python Library: Alibi

**Topic 7: Apply linear regression-based surrogate model in Local Interpretable Model-agnostic Explanations (LIME)**

* Understand global and local post-hoc methods
* Understand LIME method
* Use a simple linear regression model as local surrogate model in LIME
* Apply it to a case study

Resource:

* Python Library: Skater, InterpretML, ELI5, LIME

**Topic 8: SHAP (SHapley Additive exPlanations) and its application to a case study**

* Understand the definition of post-hoc methods
* Understand Shapley value and SHAP
* Compute and apply SHAP to a case study

Resource:

* Python Library: Alibi, InterpretML, SHAP

**Topic 9: Anchor method and its application to a case study**

* Understand local and global post-hoc methods
* Understand Anchor method
* Application to a case study

Resource:

* Python Library: Alibi, Anchor

**Topic 10: Counterfactual explanations and its application to a case study**

* Understand example-based method
* Understand counterfactual explanations
* Apply counterfactual explanations in a case study

Resource:

* Python Library: DiCE

**Topic 11: Adversarial examples and its application to a case study**

* Understand Example-based method
* Understand Adversarial Examples
* Use an algorithm to find adversarial examples in a case study

Resource:

* Python Library: Tensorflow, Pytorch, self-implement

**Topic 12: Prototypes, criticisms and their application to a case study**

* Understand example-based method
* Understand prototype and criticism
* Find and use prototypes and criticisms to explain a case study

Resource:

* Python Library: https://github.com/BeenKim/MMD-critic