**Case study 1**

Subject matter: Predict new superconductors

Key methods: Linear regression

Additional methods: Regularization techniques – L1/Lasso, L2/Ridge

**Case study 2**

Subject matter: Predict patient readmission within 30 days

Key methods: Logistic regression

Additional methods: Feature engineering, specifically imputation of missing values

**Case study 3**

Subject matter: Antispam email filter

Key methods: KNN (K-Nearest neighbors) classifier, Random Forest classifier

Additional methods: TFIDF (Term frequency, inverse document frequency), NLP (count vectorizer), multinomial Naïve Bayes, multilayer perceptron (MLP)

**Case study 4**

Subject matter: Predict bankruptcy

Key methods: Logistic regression classification with L2 regularization, Random Forest classification, XGBoost classifier

Additional methods: Randomized cv search

Evaluation methods: ROC curve (Receiver Operating Characteristic), confusion matrix, F1-score, stratified cross-validation

**Case study 5**

Subject matter:

Key methods:

Additional methods:

**Case study 6**

Subject matter:

Key methods:

Additional methods:

**Case study 7**

Subject matter:

Key methods:

Additional methods: