Corporation ESG Grade Classifying model based on Financial Statements

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- Introduction
  - Topic: To classify domestic corporation ESG Grade based on financial statements
  - A brief literature review
    - The authors built an algorithm that classifies corporate's ESG grade (2023.03.21.).
    - They collected numeric values representing corporate's financial statement as well as ESG overall rating offered by Korean Institute of Corporate governance and sustainability.
    - By considering past data from 2019 to 2021, they could obtain 1,780 rows with 13 columns.

      - Dataset: 1,780 rows x 13 cols

      - Predictor Variable: 12 varibles

      - Target Variable: 1 variable (Binary)
  - Overall plan
    - Follow thesis paper's methodology using the same Variables
    - Add the number of data instances by expanding the period and collecting past data
    - Extract additional Financial Features according to other papers
    - We will try to get Highly Accurate classifying ML model and find The Important Features
- Teammate and work division
  - Topic selection & planning: Koo Minkyu
  - Dataset preparation: Park Minseung
  - Model selection & training: ALL
  - Evaluation & parameter tuning: ALL
- Problem Statement

- problem definition
  - To classify domestic corporation ESG grade based on financial statements
  - To Find important variables that impacts ESG activities
- Approach
  - Broader approach than Thesis Paper
  - ML algorithm that predicts Future ESG overall grades based on corporation's financial statement
- Dataset
  - Financial statements from DART(Data Analysis, Retrieval and Transfer System)
  - ESG grades By Korean Institute of Corporate governance and sustainability
- Hypthesis
  - The Higher Financial Structure and Growth index, The Higher ESG Grade
  - Executive Growth and the Ratio of outside executives will be the powerful features
- Expected results and evaluation

- Technical Approach
  - Algorithms: Logistic regression, randomforest, deep neural networks
  - Results and evaluation metrics: Accuracy, F1-score, and AUR-ROC curve
  - Limitations
    - Low number of whole domestic companies
    - Company Data instances' dependency issue when retrieving past record