

Consider the `turnover.csv` data file (posted under the In-Class 7 assignment link). This file contains basic employment information of employees from some company. The goal is to build a binary classification to predict employee turnover. **In Python**, answer the following:

1. (3 points) Using the pandas library, read the csv data file and create a data-frame called `turnover`.
2. (3 points) Create the frequency table of the target variable `left`.
3. (6 points) Change `sales`, and `salary` from labels to dummy variables.
4. (6 points) Using the Box-Cox transformation, transform the `time_spend_company`. Also, transform the `number_project` and `average_monthly_hours` to 0-1 scale.
5. (5 points) Using `satisfaction_level`, `last_evaluation`, `number_project` (standardize), `average_monthly_hours` (standardize), `time_spend_company` (standardize), `Work_accident`, `promotion_last_5years`, `sales` (dummy variables), and `salary` (dummy variables) as the input variables and `left` as the target variable, split the data into two data-frames (taking into account the proportion of 0s and 1s) `train` (80%) and `test` (20%).
6. (8 points) Using `train` data-frame build a random forest model (with 500 trees and the maximum depth of each tree equal to 3). Then, use this model to make predictions on the `test` data-frame. Use the provided `precision_recall_cutoff.py` (posted under the In-Class 7 Assignment link) file to estimate the optimal cutoff value. Compute the classification report of this model.
7. (8 points) Using `train` data-frame build an AdaBoost model (with 500 trees, the maximum depth of each tree equal to 3, and learning rate equal to 0.01). Then, use this model to make predictions on the `test` data-frame. Use the provided `precision_recall_cutoff.py` (posted under the In-Class 7 Assignment link) file to estimate the optimal cutoff value. Compute the classification report of this model.
8. (3 points) Using the results from part 6 and 7, what model would use to predict `left`? Be specific.