Московский государственный технический университет им. Н.Э. Баумана

Кафедра «Системы обработки информации и управления»

Лабораторная работа №2

по дисциплине

«Методы машинного обучения»

на тему

Выполнила:

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группы ИУ5И-21М

Москва — 2024 г.

1. Цель лабораторной работы

Цель лабораторной работы: изучение продвинутых способов предварительной обработки данных для дальнейшего формирования моделей.

2. Задание

1. Выбрать набор данных (датасет), содержащий категориальные и числовые признаки и пропуски в данных. Для выполнения следующих пунктов можно использовать несколько различных наборов данных (один для обработки пропусков, другой для категориальных признаков и т.д.) Просьба не использовать датасет, на котором данная задача решалась в лекции.
2. Для выбранного датасета (датасетов) на основе материалов лекций решить следующие задачи:
    1.1.1 устранение пропусков в данных;
    1.1.2 кодирование категориальных признаков;
    1.1.3 нормализация числовых признаков.

3. Ход выполнения работы

```
import pandas as pd

from sklearn.impute import SimpleImputer

from sklearn.preprocessing import OneHotEncoder, StandardScaler


# Чтение набора данных

# Убедитесь, что путь к вашему набору данных и имя файла правильные

df = pd.read_csv('generated_dataset.csv')


# Обработка пропущенных значений

# Числовые признаки заполняются медианой

num_imputer = SimpleImputer(strategy='median')

num_columns = df.select_dtypes(include=['int64', 'float64']).columns

df[num_columns] = num_imputer.fit_transform(df[num_columns])
```

```
# Категориальные признаки заполняются наиболее частым значением
cat_imputer = SimpleImputer(strategy='most_frequent')
cat_columns = df.select_dtypes(include=['object']).columns
df[cat_columns] = cat_imputer.fit_transform(df[cat_columns])

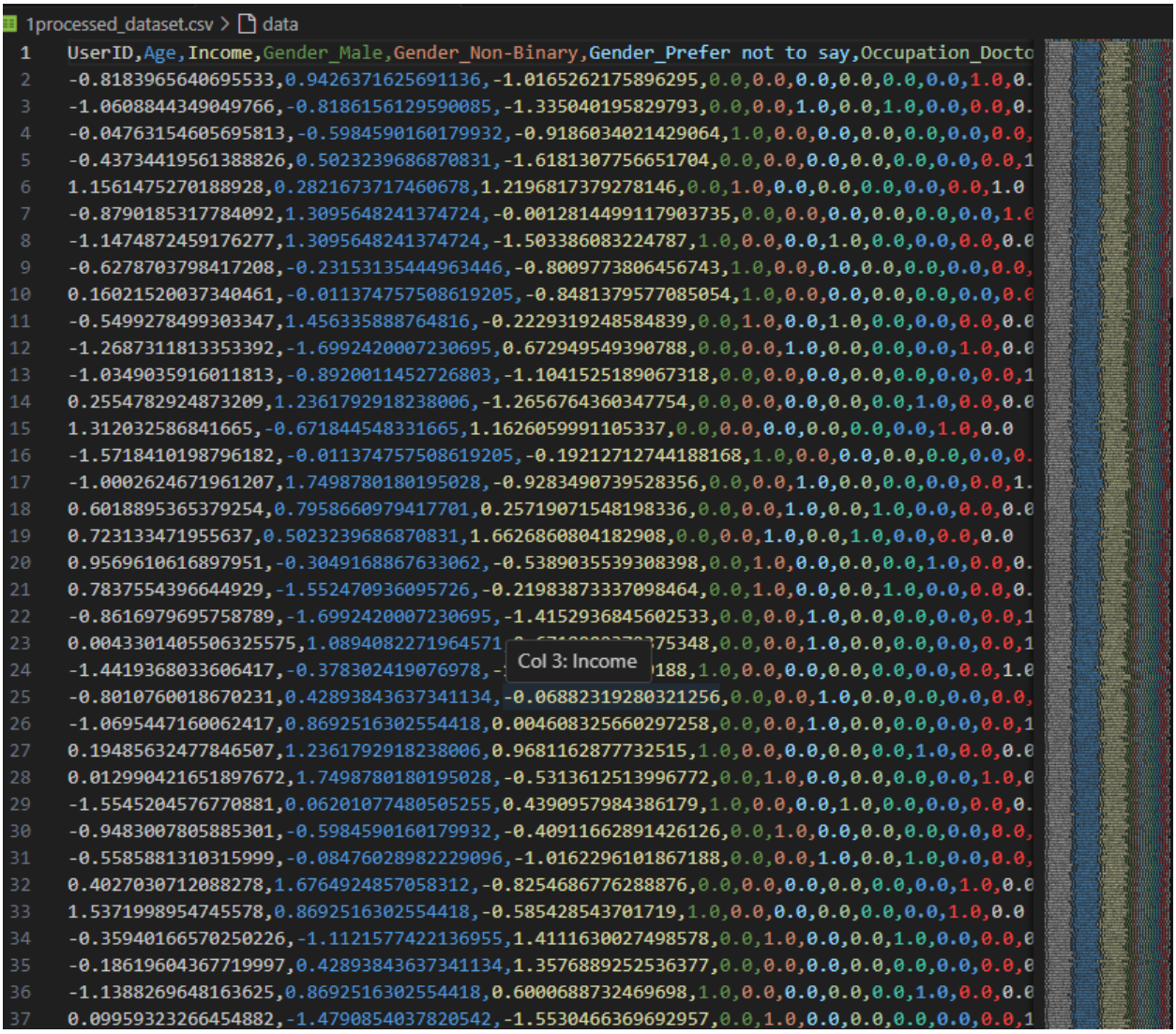
# Кодирование категориальных признаков
encoder = OneHotEncoder(drop='first')
encoded_columns = encoder.fit_transform(df[cat_columns]).toarray()
encoded_df = pd.DataFrame(encoded_columns,
columns=encoder.get_feature_names_out(cat_columns))

# Объединение закодированных категориальных признаков с исходным набором данных и удаление исходных категориальных столбцов
df = df.drop(cat_columns, axis=1)
df = pd.concat([df, encoded_df], axis=1)
# Стандартизация числовых признаков
scaler = StandardScaler()
df[num_columns] = scaler.fit_transform(df[num_columns])

# Экспорт обработанных данных в CSV
processed_dataset_path = 'processed_dataset.csv'
df.to_csv(processed_dataset_path, index=False)

print(f"数据预处理完成，文件 '{processed_dataset_path}' 已保存.")
```

Результат:




```
UserID,Age,Income,Gender_Male,Gender_Non-Binary,Gender_Prefer not to say,Occupation_Docto
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