- converted all breaks to relevant header
- dropped unnecessary columns
- applied frequency encoding with folds of groups
- applied target encoding with folds of groups
- fixed an error in the encoding with PCA, then apply autoencoders/ some supervised learning method
- fixed an error in the encoding with PCA, then apply autoencoders/ some supervised learning method

```
!pip install pandas
```

```
Requirement already satisfied: pandas in /usr/local/lib/python3.10/dist-packages (2.1.4)
Requirement already satisfied: numpy<1,26,0b1,>=1.22.4; sys_platform != "win32" and platform_machine != "aarch64" or platform_machine == "aarch64" and sys_platform == "linux" in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.10/dist-packages (2.8.2)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (2023.4)
Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (2024.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (1.16.0)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.10/dist-packages (1.2.2)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.10/dist-packages (1.13.1)
Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (1.4.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (3.5.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (4.53.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (1.4.7)
Requirement already satisfied: numpy>=1.20 in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (3.1.4)
Requirement already satisfied: dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (2.8.2)
Requirement already satisfied: seaborn in /usr/local/lib/python3.10/dist-packages (0.13.2)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: pandas>=1.2 in /usr/local/lib/python3.10/dist-packages (2.1.4)
Requirement already satisfied: matplotlib!=3.6.1,>=3.3 in /usr/local/lib/python3.10/dist-packages (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (4.53.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (1.4.7)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (3.1.4)
Requirement already satisfied: dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (2.8.2)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (2023.4)
Requirement already satisfied: tzdata>=2022.1 in /usr/local/lib/python3.10/dist-packages (2024.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (1.16.0)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (4.66.5)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: scipy in /usr/local/lib/python3.10/dist-packages (1.13.1)
Requirement already satisfied: numpy<1.23.5 in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.19.5; platform_machine != "aarch64" or platform_machine == "aarch64" and platform_system != "Linux" in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: numpy>=1.21.6; platform_machine == "aarch64" and platform_system == "Linux" in /usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.1; platform_machine != "aarch64" or platform_system != "Linux" and platform_machine != "arm64" or platform_system != "Darwin" and platform_machine != "arm64" and platform_machine != "aarch64" and platform_machine != "ppc64le" and platform_machine != "s390x" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.2; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system != "AIX" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "AIX" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "Linux" and platform_machine != "aarch64" and platform_machine != "ppc64le" and platform_machine != "s390x" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "Linux" and platform_machine == "ppc64le" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "Linux" and platform_machine == "s390x" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "Linux" and platform_machine == "aarch64" in /usr/local/lib/python3.10/dist-packages (1.23.4)
Requirement already satisfied: numpy>=1.16.5,<1.26.0b1,>=1.19.3; platform_machine == "aarch64" or platform_machine == "arm64" or platform_machine == "ppc64le" or platform_machine == "s390x" and platform_system == "Linux" and platform_machine == "arm64
```