Week_1

In the first week, we learned about Python and some of the topics of Python: Data types, Conditions (if/ else), Functions, Class and objects, Loops(while and for), Dictionaries, Lists, and in addition to these, I completely understand: Recursion, Inheritance, Syntactic sugar, Import/Export classes, Write/Read files in .py, Lambda functions, etc.

Week_2

The second week was the beginning of Machine Learning conceptions and basics. In the class, I learned about NumPy (a library for Python to work with arrays), Pandas (a data manipulation library for Python), and the sklearn library for ML-powered in Python. Briefly, the sklearn library was the first step to understanding ML and what kind of functions I can use in ML to test, train and make models.

To upload certain data and make predictions on it :

1. We have to understand GT (ground truth - the target which we want to predict) and Features (the labels which we want to use to predict GT).

2. In the next step: Loss(evaluate how my algorithms set well to my models), Predictions, Weights, Bias(sort of mistake), Learning rate(alpha), MeanSquaredError (check accuracy (prediction - GT)**2), Iteration (predict one time), Optimization (trying to improve the accuracy of ML models)

3. Then we discussed splitting data: Train (Validation) and Test sets by using the train_test_split function which helps us to split our data into the Train and Test sets. (test_split = 0.2 which means I get 80% data to train and 20% to test my data).
4. In the next step, Encoders and Scalers (OneHotEncoder, MinMaxScaler, StandardScaler, RobustScaler, Label Encoding, Target Encoding, and Normalization.) came to convert my data into small numbers which are easy to predict and illustrate.

5. Then we used 2 new concepts: Pipelining(end-to-end construct) and ColumnTransformer function(apply transformers in particular columns).

6. After applying the transformer, we trained our data with the help of fit(helps to fit the data into the model), transform(transform the data into a form which is easy to interact in the model), fit_transform(a combination of these two methods: fit and fit-transform).

Week_3

My first experience in DL(Deep Learning). To work in DL, we have to choose the right library/tool. One of them is TORCH (PyTorch) which is an open-source Machine Learning library(ML).
In ML, we can model and predict small amounts of data but in the modern world, we have to work with images, video, texts, audio, and thousands of features. At this time DL and PyTorch (popularity) are a much better solution to model data.

In this class, I learned about DL basics, PyTorch library, opening datasets, and random images, using matplotlib to illustrate my data, transforms (sometimes when we upload data we have to apply some transforms to check certain cases, https://pytorch.org/vision/stable/transforms.html), splitting data into train and test sets, the main differences between CPU and GPU, batches (several runs of computations: for example, when we have 5400 data and if we modify our batch = 100, the computer can analyze 100 images in one time. ‘Batch = 32 is a better choice ’) and DataLoader (helps to create manageable data).