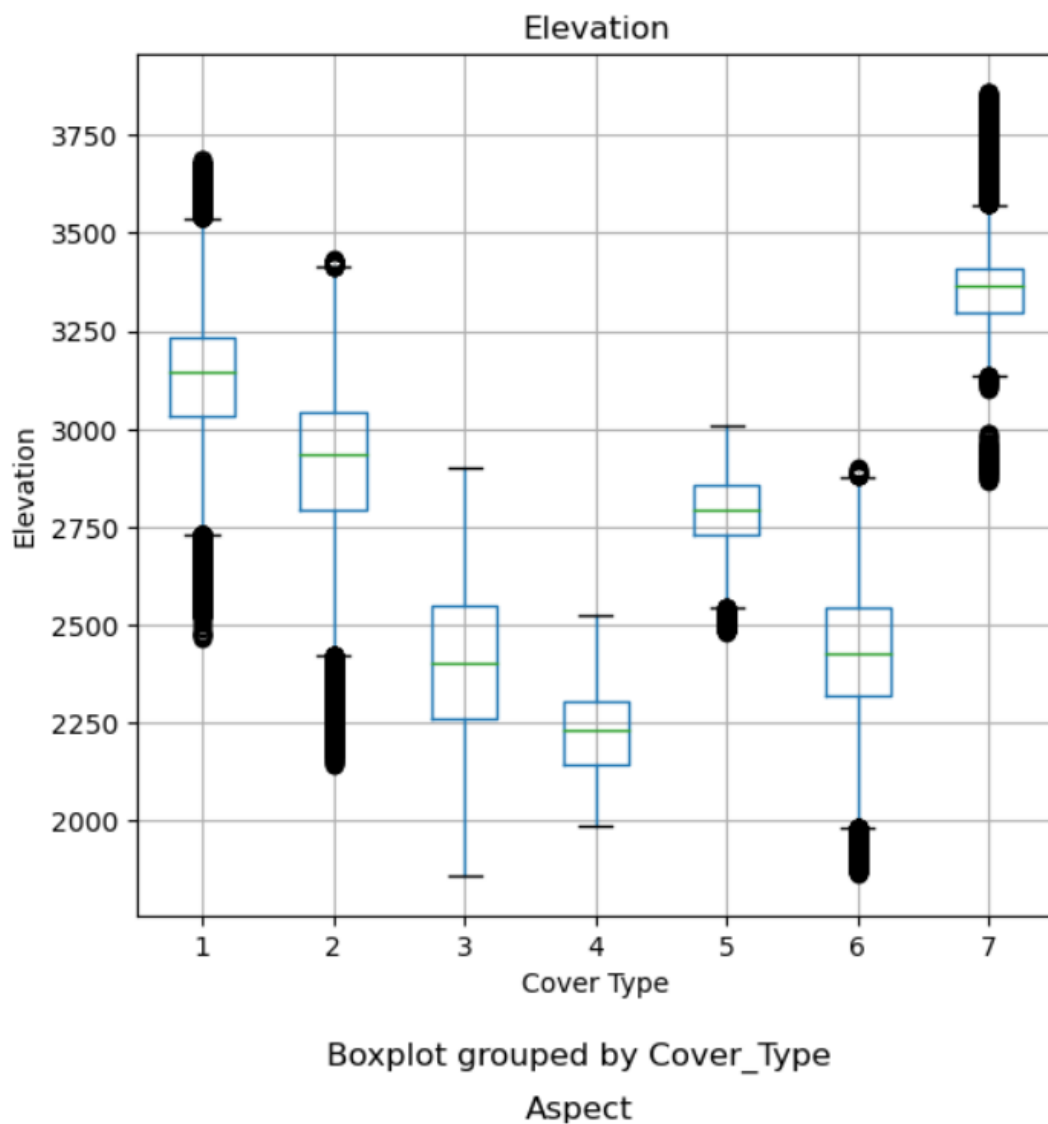


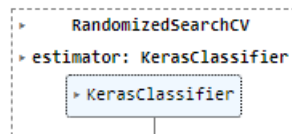
# Forest cover type

The task involved building and testing different models on a given dataset to predict forest cover type based on cartographic variables.

The entire task was divided into several files. Jupyter Notebook was used to build the models, but the file added to the GitHub platform has a .py format. The first file, named "Heuristic.py", contains code in which initial data analysis was performed to obtain important information. At the end, based on one variable('Elevation'), a simple heuristic logic was written.



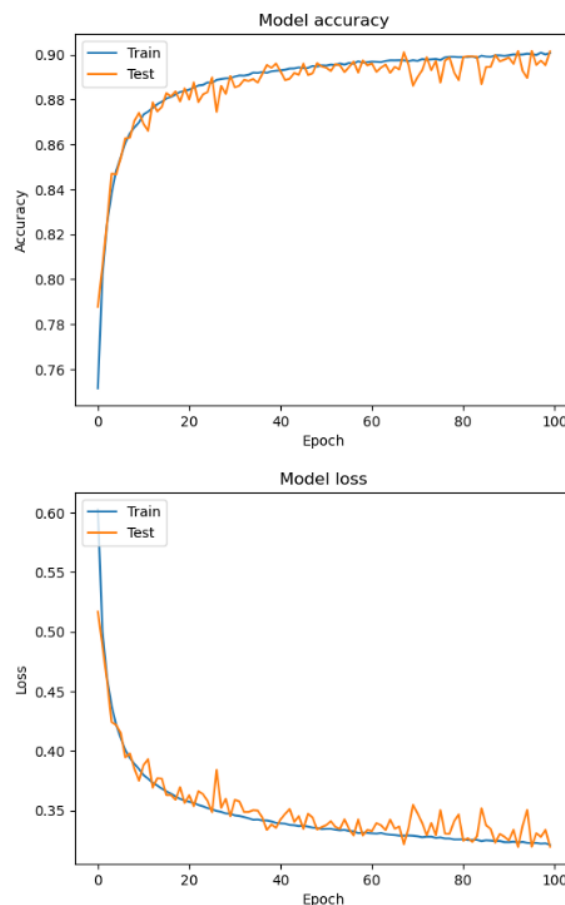
The next file, "Sklearn.py", contains the process of training 2 models: logistic regression and random forest. The third file, named "Tensorflow.py", contains code in which different variants of parameters were tested using functions to find the best one. Then, a custom neural network was created with the best parameters.



```
print("Best params:", rnd_search_cv.best_params_)
print("Best score:", rnd_search_cv.best_score_)
```

```
Best params: {'reg_strength': 0.0001, 'neurons': 128, 'learning_rate': 0.001, 'hidden_layers': 2}
Best score: 0.8922030329704285
```

Next, learning plots for the model were printed, from which it can be inferred that the model was learning properly - the accuracy value increased with each epoch, and the loss function decreased.



A bar chart comparing three performance metrics (Accuracy, F1-score, and Precision) across four models: Heuristic, Logistic Regression, Random Forest, and Deep Learning. The y-axis represents the metrics, ranging from 0.0 to 0.8. The legend indicates that blue bars represent Accuracy, light blue bars represent F1-score, and orange bars represent Precision.

Model	Accuracy	F1-score	Precision
Heuristic	0.43	0.31	0.31
Logistic Regression	0.72	0.52	0.59
Random Forest	0.93	0.90	0.92
Deep Learning	0.89	0.85	0.87

```
Send Request
POST http://localhost:5000/predict/logistic_regression
Content-Type: application/json

{
  "data" : [[2902, 93, 15, 30, 7, 949, 243, 215, 98, 2160, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0]]
}
```

---

All files have additional descriptions of used functions.