**Task #4**

1. Apply the logistic regression method using the functions in the notebook «Logistic Regression as a Neural Network – BP alg.ipynb” to predict the biological response of a molecule

data: *bioresponse.csv*,

description from Kaggle: *“The data is in the comma separated values (CSV) format. Each row in this data set represents a molecule. The first column contains experimental data describing a real biological response; the molecule was seen to elicit this response (1), or not (0). The remaining columns represent molecular descriptors (d1 through d1776), these are caclulated properties that can capture some of the characteristics of the molecule - for example size, shape, or elemental constitution. The descriptor matrix has been normalized.”).*

Use 75% of the dataset to train the model, and the rest of the data to estimate its accuracy.

1. Modify optimize() function to implement the **stochastic gradient descent (SGD)** method and **Adam optimization** method using the numpy library. Apply them to solve the problem from p.1.
2. For three modifications of gradient descent (GD, SGD and Adam) plot the learning curves (dependence of the value of the loss function on the iteration number), apply models with different values ​​of the learning rate (at least 5 different learning rates). How does it affect the accuracy of the model?
3. Compare the accuracy of the models fitted with various BP algorithms.