Objective

The goal of this assignment is to familiarize yourself with TensorFlow Keras by building and training a neural network to predict the survival of passengers on the Titanic. You will work with an the already cleaned version of the Titanic dataset to see what results you can achieve.

After learning about neural networks, seeing TensorFlow Keras in action, and getting to know some tips to train a better network. Now is the time to try them out.

Instructions

1. **Building the Neural Network**
    - Research some network architectures
    - Define a Sequential model using Keras.
    - Add appropriate layers (e.g., Dense layers) with activation functions **like** ReLU for hidden layers and sigmoid for the output layer.
    - Use dropout, normalization, regularization and other techniques discussed to get better results.
    - Compile the model with a suitable optimizer (e.g., Adam) and loss function (e.g., binary cross-entropy).
2. **Training the Model**
    - Split the dataset into training and testing sets.
    - Train the model on the training set and validate it on the testing set.
    - Experiment with different hyperparameters (e.g., number of epochs, batch size, learning rate) to see how they affect the model's performance.
3. **Evaluation**
    - Evaluate the model on the testing set using metrics like accuracy, precision, recall, and F1-score.
    - Generate and display a confusion matrix to understand the model's performance in more detail.