This project is build of 3 main stages.
The first one is a download data script which downloads the data, preprocesses it and saves it to files that are ready for training.
In this code after downloading the train set and the test set i take data in a size of 10% of the train set to a validation set. This set is chosen explicitly from the training set in a way that there is an equal representation for each class. I didn't do a random split here because the original set is sorted randomly so it won't have any effect but in other datasets there will be need to add this aspect as well in this stage.
The second stage is the model training. I used a SimpleCNN model type and trained it on the above data when I added the simple training epoch a validation check on every epoch. The learning rate I chose is 0.01 which seems a good fit to the batch size and the data size and diversity in general. The optimizer function I chose is SGD which is a simple approach that is usually ok for small resolution images as in this project. (if I had more time I would check the RMSprop)
The third step is the evaluation step. In this step I check the results of the trained model on the test set. In this task I assumed the test set is valid, in real world missions to make a valid test set is a big challenge. This stage influenced the other 2 because I compared results of different transformations and different number of epochs to get to the final model I got.

The challenges I faced are to understand which transformations will help the training and which number of epochs. Also to decide which approach to use in the type of model and the project structure. I created functions that will help me compare and read and learned to choose the best approaches.

visualized results:
model prediction:**ship,deer,truck,horse,truck,truck,dog,truck,bird,cat**
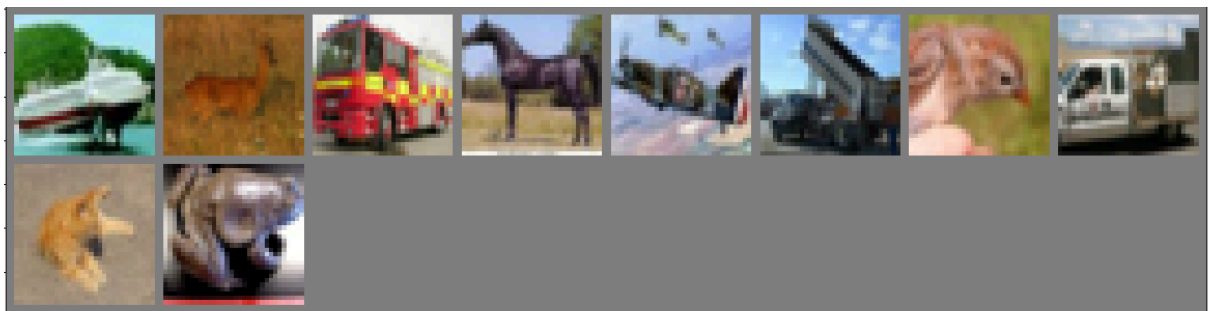
For the evaluation of the model I printed the different score calculations, the accuracy is general and the other are only for ship class but can be calculated for any class. There is no meaning for those scores on general results.

```
+-----------+-----------+
| ship      |   results |
+===========+===========+
| Accuracy  |   0.66    |
+-----------+-----------+
| Precision |   0.8     |
+-----------+-----------+
| Recall    |   0.75    |
+-----------+-----------+
| F1-Score  |   0.77    |
+-----------+-----------+
```

I want to add that I could certainly choose a better algorithmic approach ,test more augmentations and in general I have many thoughts on how to improve this project. Nevertheless I chose to neglect some of the stuff in order to finish inside the time limits.