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Kaggle Project

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1. Environment

There are 3 files: CS480_KaggleComp.ipynb, Resnet50model.pth and kaggleComp.csv
All the code of this project can be found in CS480_KaggleComp.ipynb.
The trained model is saved as Resnet50model.pth.
The csv file submitted on Kaggle is kaggleComp.csv. All predictions are stored in this file.

2. Architecture

Resnet50 is used. There are two main advantages of using Resnet architecture:

- Networks with large number (even thousands) of layers can be trained easily without increasing the training error percentage.
- ResNets help in tackling the vanishing gradient problem using identity mapping.

The parameters are as followed:

```
# Parameters
batch_size = 8
learning_rate = 2e-4
num_of_epochs = 10
loss_func = nn.CrossEntropyLoss()
optimizer = optim.Adam(cnn.parameters(), lr=learning_rate)
```

Adam Optimizer works well in general so it is used. Pretrained Resnet50 model is used as it is difficult to train a model from scratch. It is more efficient to use pretrained model and we only have a tiny training data set.

The training loss and training accuracy are printed for tuning parameters. We don't want the loss too low to avoid overfitting.

3. Final words

This project provides students with an interesting exercise to machine learning. I learn a lot from the project as well as the course. Hopefully, the skills I learned can be applied to my future.