

## CATS VS DOGS IMAGE CLASSIFICATION TASK

### ARCHITECTURE USED:

#### EXP3.1: Convolutional Layers:

Conv1: From 3 input channels to 32 feature maps. Conv2: From 32 to 64 feature maps. Conv3: From 64 to 128 feature maps. Pooling: After each convolution, max pooling reduces spatial dimensions (height and width) but keeps the number of feature maps unchanged.

Flattening: After the third convolutional block, the 128 feature maps are flattened into a 1D vector, which is passed to fully connected layers.

#### Fully Connected Layers:

First fully connected layer: 512 neurons. Output layer: 2 neurons (for binary classification). So, the number of features starts from 3 (input channels) and increases to 128 (after the final convolution), then the features are flattened into a vector passed through 512 neurons before the final 2-class output.

dataset: cats vs dogs optimiser: adam,lr=0.001

weight initialisation:default

activation function :relu

learnings: I am satisfied with this architecture i have applied batch normalisation as well as dropout layer to reduce the chance overfitting will experiment with more different types of optimisers

### EXP3.2

```
DL EXP3.2

CNN architecture:same

Weight initialisation:Default in pytorch

optimiser:SGD also used a learning rate scheduler

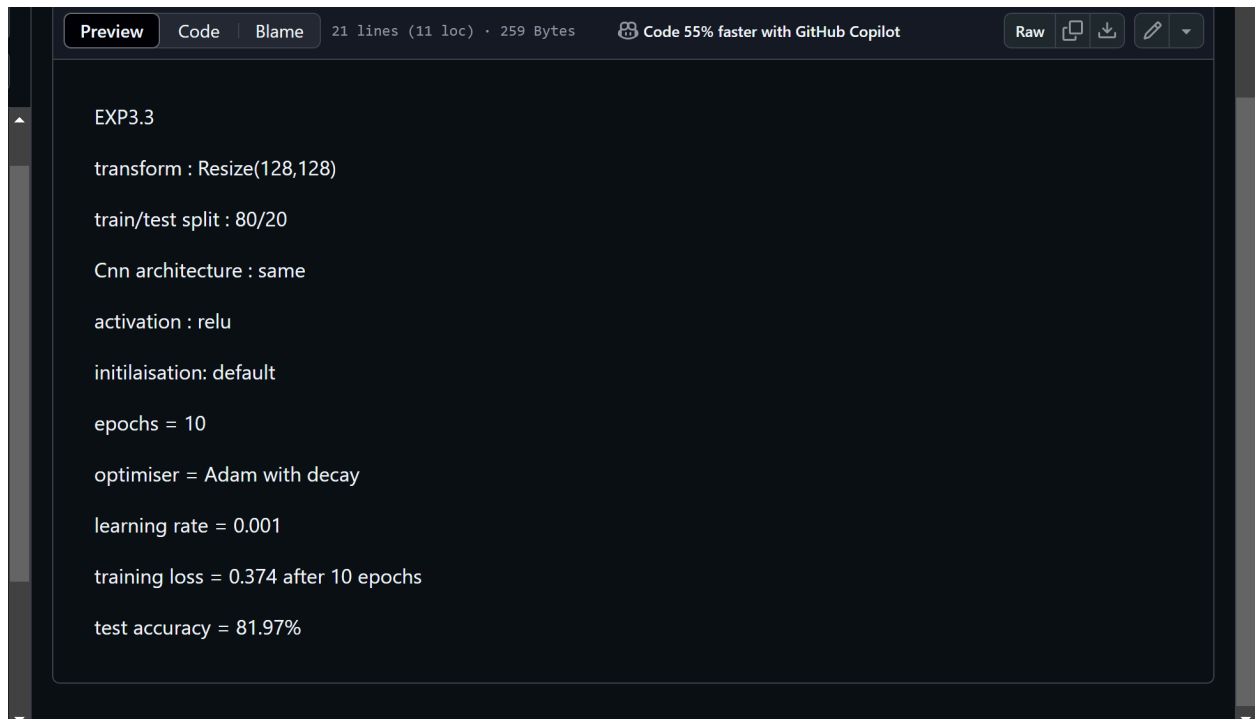
epochs=10

training loss:very poor

test accuracy:50%

train/test split:80/20
```

### EXP3.3



The screenshot shows a GitHub file viewer interface for a file named 'EXP3.3'. The interface includes a top bar with tabs for 'Preview', 'Code', and 'Blame'. The 'Preview' tab is active, displaying the file's content. The file's metadata indicates it is 21 lines (11 loc) and 259 Bytes. A banner at the top right promotes GitHub Copilot, stating 'Code 55% faster with GitHub Copilot'. The file content is as follows:

```
EXP3.3

transform : Resize(128,128)

train/test split : 80/20

Cnn architecture : same

activation : relu

initialisation: default

epochs = 10

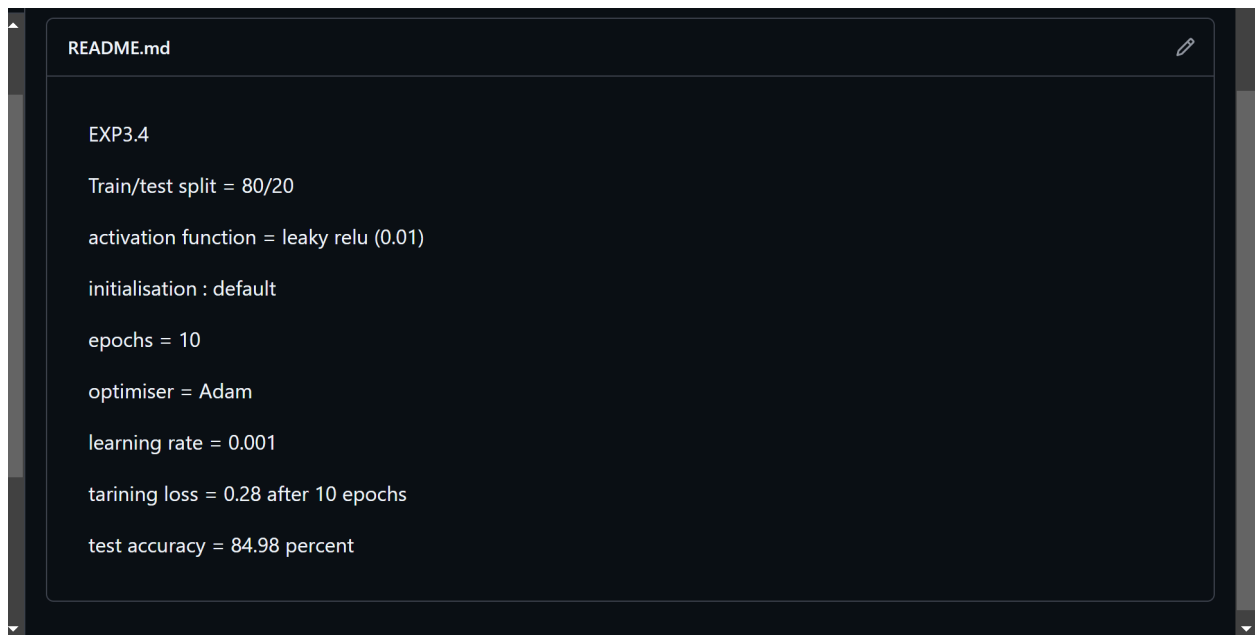
optimiser = Adam with decay

learning rate = 0.001

training loss = 0.374 after 10 epochs

test accuracy = 81.97%
```

### EXP3.4(BEST MODEL)



The screenshot shows a GitHub file viewer interface for a file named 'EXP3.4(BEST MODEL)'. The interface includes a top bar with tabs for 'Preview', 'Code', and 'Blame'. The 'Preview' tab is active, displaying the file's content. The file's metadata indicates it is 21 lines (11 loc) and 259 Bytes. A banner at the top right promotes GitHub Copilot, stating 'Code 55% faster with GitHub Copilot'. The file content is as follows:

```
EXP3.4

Train/test split = 80/20

activation function = leaky relu (0.01)

initialisation : default

epochs = 10

optimiser = Adam

learning rate = 0.001

training loss = 0.28 after 10 epochs

test accuracy = 84.98 percent
```

## EXP3.5

```
README.md

EXP3.6

train/test split : 80/20

activation : tanh

initialisation : xavier

eposchs = 10

training loss = 0.4145

Test accuracy = 77.9%
```

## EXP3.7

```
Preview Code Blame 19 lines (9 loc) · 195 Bytes Code 55% faster with GitHub Copilot Raw Copy Download Edit

EXP3.7

train/test split = 80/20

activation function = tanh

initialisation = xavier

eposchs = 10

optimiser = Rmsprop

learning rate = 0.001

training loss = 1.0168

test accuracy = 66.53%
```

## EXP 3.8

```
README.md

EXP3.8 train/test split = 80/20

activation func = tanh

initialisation = xavier

optimiser = SGD

learning rate = 0.01

training loss = 0.5657 after 10 epochs

test accuracy = 75.46%
```

## EXP3.9

```
Preview Code Blame 13 lines (7 loc) · 152 Bytes Code 55% faster with GitHub Copilot Raw Copy Download Edit

train/test : 80/20

initilisation : He

activation: relu

optimiser = Adam

lr = 0.001

training loss= 0.404 after 10 epochs

testing accuracy = 78.83%
```

## EXP3.10

```
README.md

EXP3.10

train/test = 80/20 initialisation = He

activation : Relu

optimiser = SGD

lr = 0.01

training_loss = 0.696 after 10 epochs

testing accuracy = 50.58%
```

## EXP 3.11

```
Preview Code Blame 13 lines (7 loc) · 229 Bytes Code 55% faster with GitHub Copilot Raw Copy Download Edit

EXP3.11

In this version i finetuned resnet-18 on my catsvsdogs dataset

optimiser = Adam

learning rate = 0.0001

training loss = 0.196 after 10 epochs

test _ accuracy = 92.69%

my best model test accuracy was 84.98% in exp3.4
```