Hackathon: Fast Fashion

Group 2
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01 Problem Statement

Problem Statement

- **Shapeshifting** militant **insurgents** from the planet Omicron-6
- **Enemy leader** meeting backers at **Fashion Week** on alpha-Earth in disguise
- **Must learn human fashion terms to blend in** at Fashion Week
- Infiltrate the events to **ASSASSINATE** THE (fake) PRIME MINISTER OF MALAYSIA!

02

The Data

Fashion-MNIST dataset (from Kaggle)

Fashion-MNIST:

Dataset consisting of a training set of 60,000 examples and a test set of 10,000 examples. Each example is a 28x28 grayscale image, associated with a label from 10 classes.

Label Legend:

Training dataset :

- 0 = T-shirt/top
- 1 = Trouser
- 2 = Pullover
- 3 = Dress
- 4 = Coat
- 5 = Sandal
- 6 = Shirt
- 7 = Sneaker
- 8 = Bag
- 9 = Ankle boot

Our process

Data Transformation

Scale data

Tuning Parameters

Batch Size
Epochs
Activations...

1 → 2 → 3 → 4

Data Collection

Fashion-MNIST

Model Selection

Convolutional Neural Network

03

Model Selection

Convolutional Neural Networks

Modeling Overview

TensorFlow & Keras

Using Keras, we created a variety of sequential models, building layer by layer, trying different parameter values and the order and number of layers to find the best performing one.

In our base model...

04

Parameter Selection

Layers, Filters, Kernel size, Batch size, Epochs, Optimizer Type

Params:

Layers

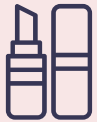
2 or 3

Flattening

Flatten after first layer

Epochs

10



Filters

32, 64, 128

Dropouts

Yes/No
Where

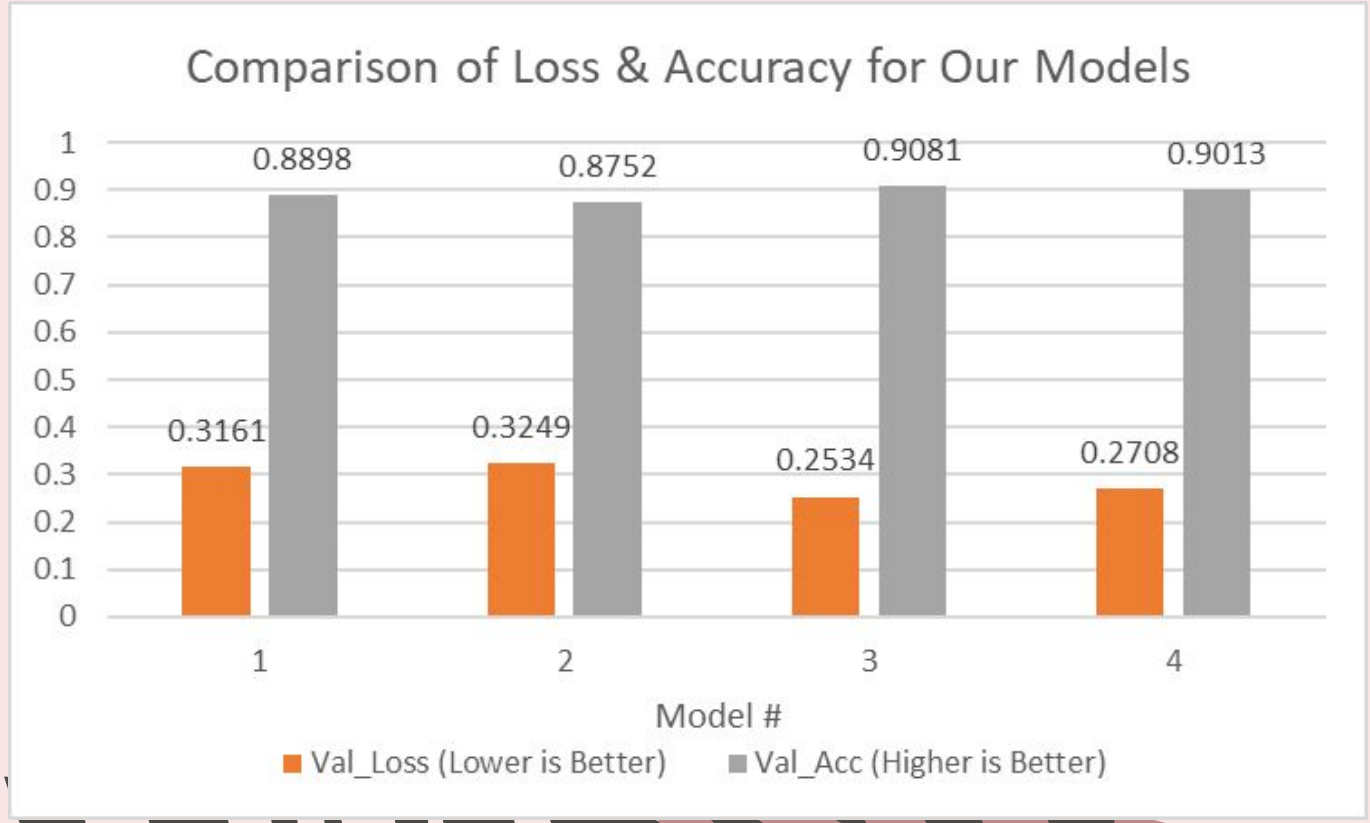
Optimizer

Rmsprop vs Adam

05

Model Comparison

All Models Summary



All Models Summary

	Optimizer	Layers	Dropout	Loss	Accuracy	Val_Loss	Val_Acc
1	rmsprop	2	No	0.286	0.9009	0.3161	0.8898
2	rmsprop	2	Yes	0.3092	0.8876	0.3249	0.8752
3	**rmsprop**	**3**	**Yes**	**0.1959**	**0.9273**	**0.2534**	**0.9081**
4	Adam	3	Yes	0.1565	0.9429	0.2708	0.9013

Measure of Success:

Accuracy

How well the model performs across all classes.

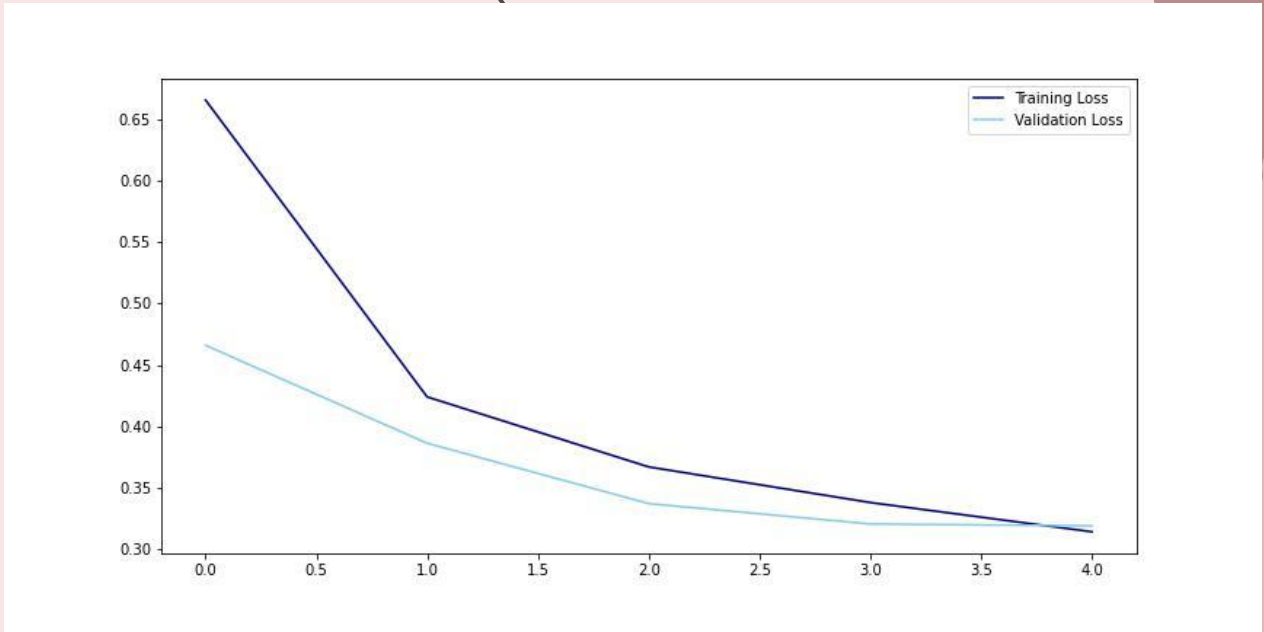
Since we have 10 classes this will be the best metric to utilize.

Also looking to minimize loss as much as possible without sacrificing accuracy.

Baseline Accuracy = 10%

Model 1:

- 2 Convolutional layers (32, 64)
- 1 Dense Layer (10)
- Optimizer (rmsprop)

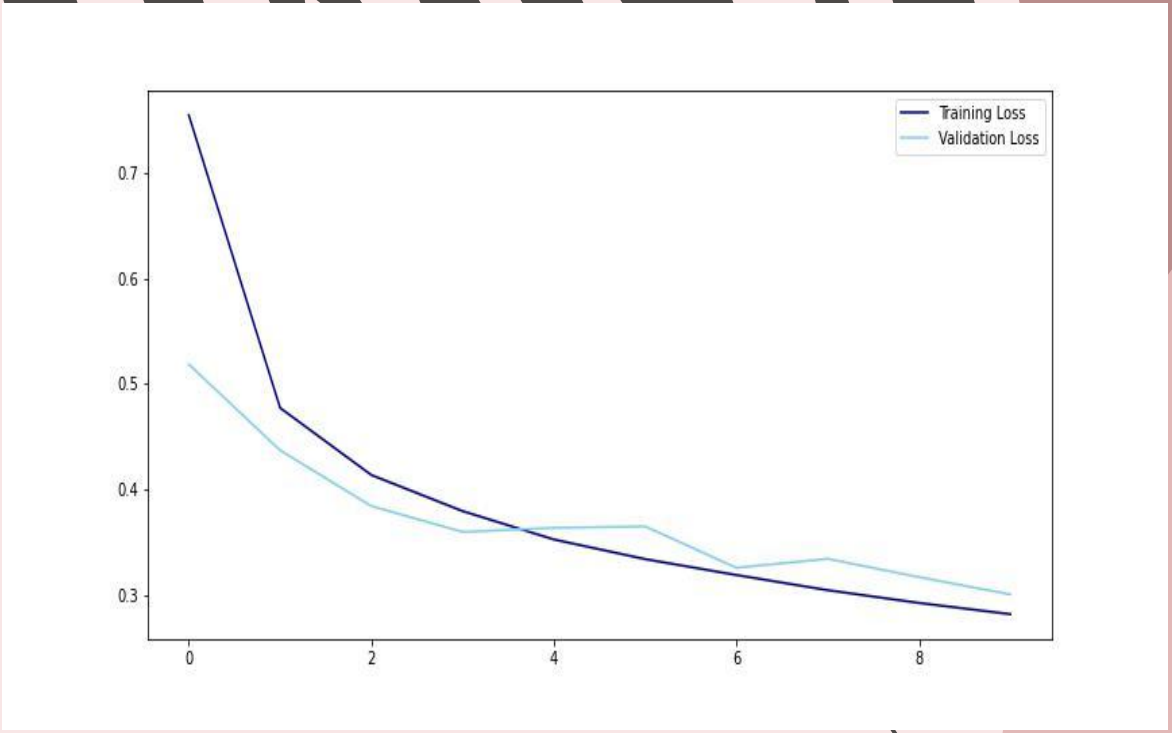


Model 1:

	Optimizer	Layers	Dropout	Loss	Accuracy	Val_Loss	Val_Acc
✗	**1**	**rmsprop**	**2**	**No**	**0.286**	**0.9009**	**0.3161**	**0.8898**
✗	2	rmsprop	2	Yes	0.3092	0.8876	0.3249	0.8752
✓	3	rmsprop	2	Yes	0.1959	0.9273	0.2534	0.9081
✗	4	Adam	3	Yes	0.1565	0.9429	0.2708	0.9013

Model 2:

- 2 Convolutional layers (32, 64)
- 1 Dense Layer (10)
- Optimizer (rmsprop)



Model 2:

	Optimizer	Layers	Dropout	Loss	Accuracy	Val_Loss	Val_Acc
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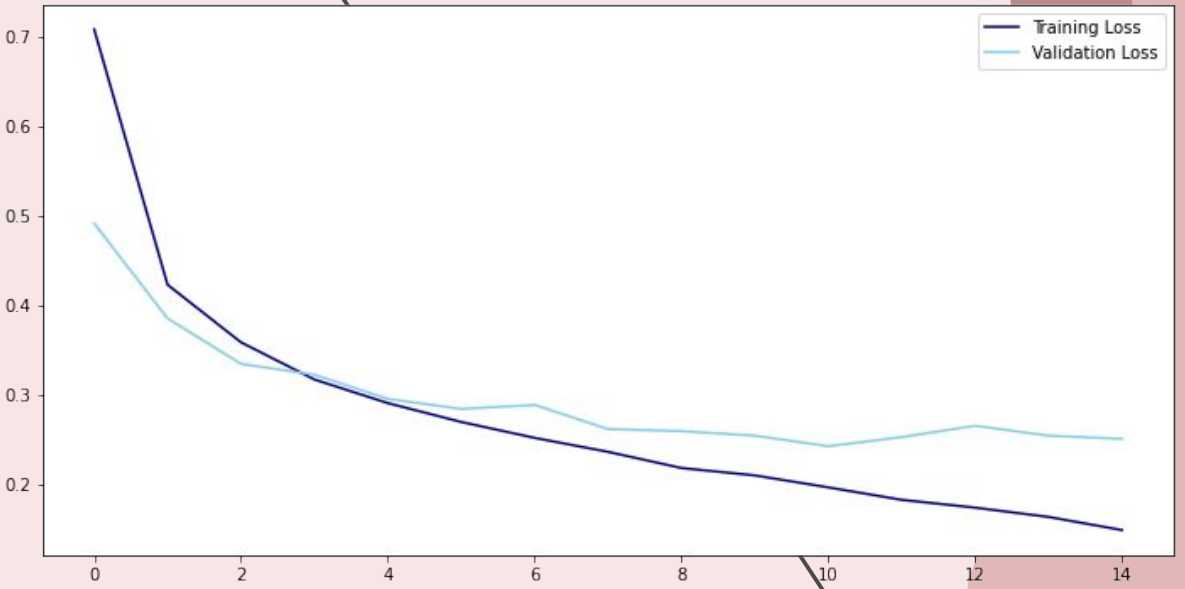
3	rmsprop	2	Yes	0.1959	0.9273	0.2534	0.9081
4	Adam	3	Yes	0.1565	0.9429	0.2708	0.9013

Model 4:

- 3 Convolutional layers. Kernels 32, 64, 128
- 2 Dense layers, 128 & 10
- Optimizer (adam)

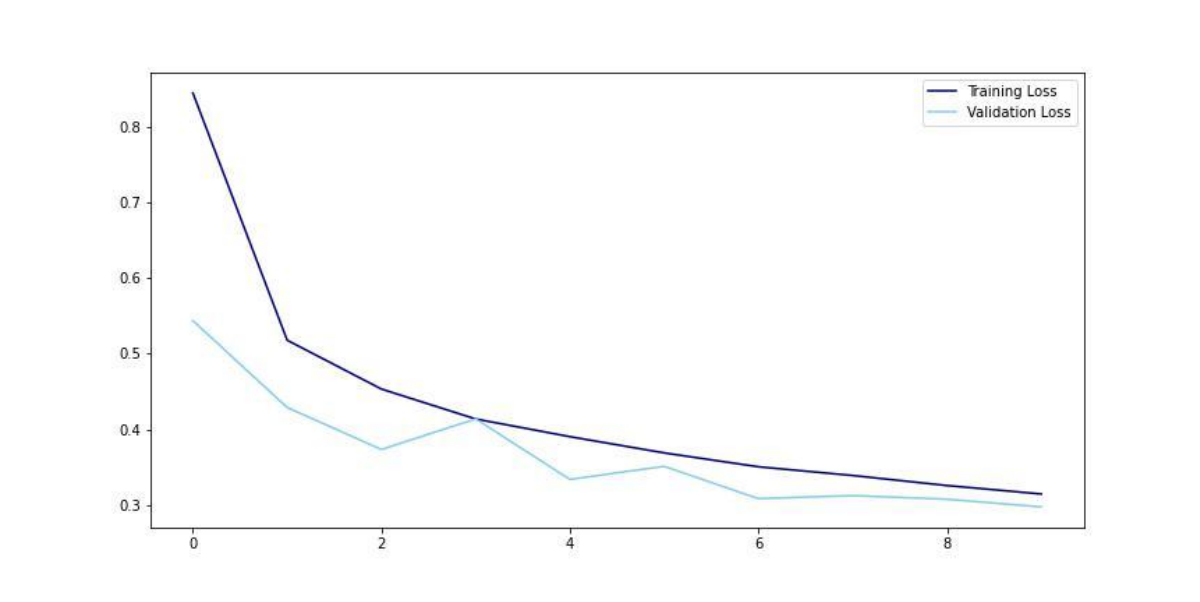


Model 4:

	Optimizer	Layers	Dropout	Loss	Accuracy	Val_Loss	Val_Acc
✗ 1	rmsprop	2	No	0.286	0.9009	0.3161	0.8898
✗ 2	rmsprop	2	Yes	0.3092	0.8876	0.3249	0.8752
✓ 3	rmsprop	2	Yes	0.1959	0.9273	0.2534	0.9081
✗ **4**	**Adam**	**3**	**Yes**	**0.1565**	**0.9429**	**0.2708**	**0.9013**

Model 3:

- 2 Convolutional layers (32, 64)
- 2 Dense Layers (32, 10)
- Only model with **Dropout**
- Optimizer (rmsprop)



Model 3:

	Optimizer	Layers	Dropout	Loss	Accuracy	Val_Loss	Val_Acc
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✗ 4	Adam	3	Yes	0.1565	0.9429	0.2708	0.9013

Conclusion

Model 3 performed the best with the validation loss significantly lower than the training loss.

Accuracy: 90.81

Validation Loss: 0.2534

Recommendations

- Implementing dropout
- Adding more convolutional layers
- Testing out different optimizers

Epilogue

- Most common misclassification by the model is that it classifies 6:shirts as 0:T-shirt/top or 4:Coat
- Critical blunder! Operative blew his cover referring to a shirt as a coat.
- Enemy target escaped off-world.

Thanks!

Do you have any questions?