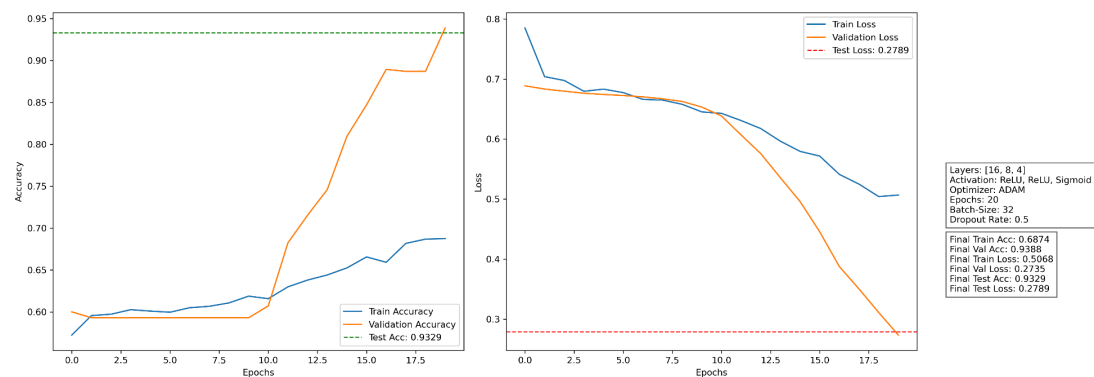# MLB Game Outcome Prediction - Model Evaluation Report

Each model uses ReLU activations, the Adam optimizer, and a dropout rate of 0.5 for regularization.

Data split : 70% Training, 10% Validation, 20% Testing

Models (Ordered by Testing Acc%)

_____

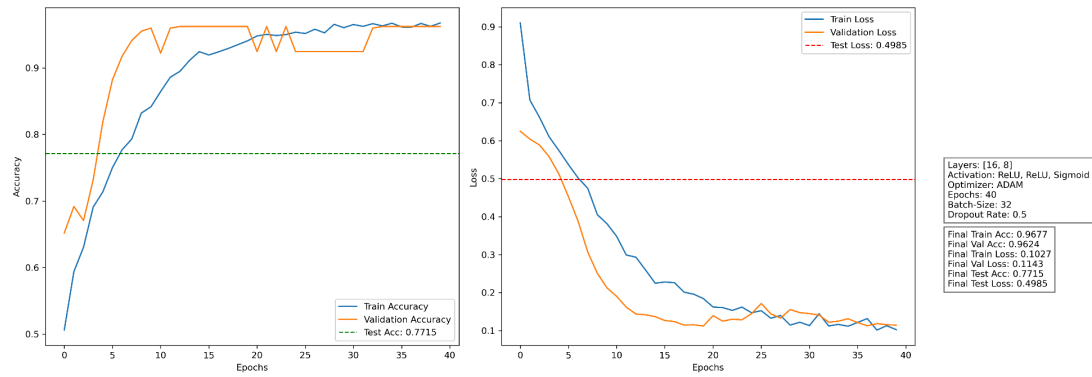### 1) Layers : 16-8-4, Epochs : 20

Training Accuracy : 68.74%

Validation Accuracy : 93.88%

Testing Accuracy : 93.29%

_____

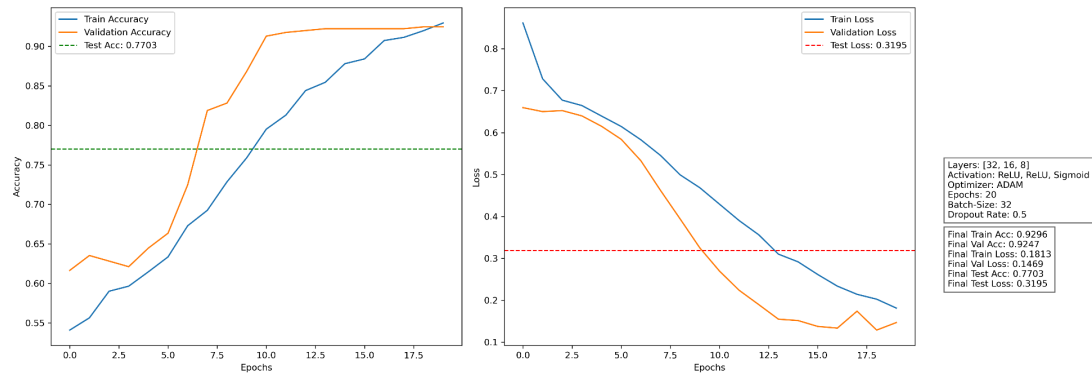## 2) Layers : 16-8, Epochs : 40

Training Accuracy : 96.77%

Validation Accuracy : 96.24%

Testing Accuracy : 77.15%
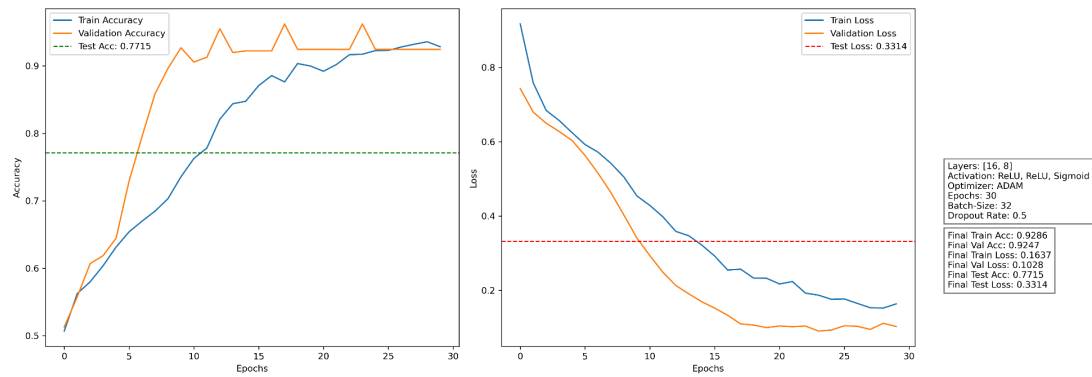
3) Layers : 32-16-8, Epochs : 20

Training Accuracy : 92.96%

Validation Accuracy : 92.47%

Testing Accuracy : 77.03%

4) Layers : 16-8, Epochs : 30
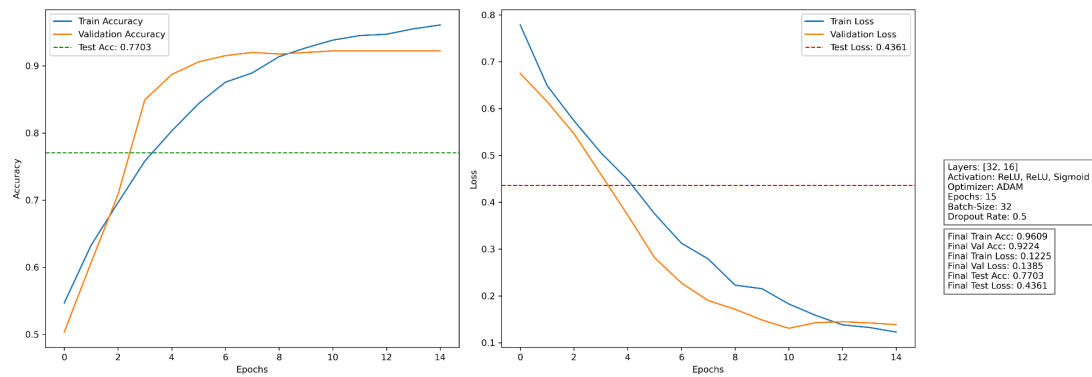

Training Accuracy : 92.86%

Validation Accuracy : 92.47%

Testing Accuracy : 77.15%

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5) Layers : 32-16, Epochs : 15

Training Accuracy : 96.09%

Validation Accuracy : 92.24%

Testing Accuracy : 77.03%

Evaluation (2024 Data)

Accuracy :

```
Model,Test Accuracy,Test Loss
model 16-8-4 drop0.5 20251018 092556,0.9328621625900269,0.2788989543914795
model 32-16-8 drop0.5 20251018 092553,0.7703180313110352,0.31948694586753845
model 16-8 drop0.5 20251018 092601,0.7714958786964417,0.4985409080982208
model 32-16 drop0.5 20251018 091545,0.7703180313110352,0.43605849146842957
model 16-8 drop0.5 20251018 091558,0.7714958786964417,0.33143648505210876
```

Confusion Matrices :

```
Model : model 16-8-4 drop0.5 20251018 092556
,Pred_0,Pred_1
Actual_0,547,16
Actual_1,41,245


Model : model 32-16-8 drop0.5 20251018 092553
,Pred_0,Pred_1
Actual_0,385,178
Actual_1,17,269


Model : model 16-8 drop0.5 20251018 092601
,Pred_0,Pred_1
Actual_0,385,178
Actual_1,16,270


Model : model 32-16 drop0.5 20251018 091545
,Pred_0,Pred_1
Actual_0,385,178
Actual_1,17,269


Model : model 16-8 drop0.5 20251018 091558
,Pred_0,Pred_1
Actual_0,385,178
Actual_1,16,270
```

Evaluation (2025 Data)

Accuracy :

```
Model,2025 Test Accuracy,2025 Test Loss
model_16-8-4_drop0.5_20251018_092556.h5,0.8723800778388977,0.3203538358211517
model_32-16-8_drop0.5_20251018_092553.h5,0.9743828773498535,0.081054560840129
model_16-8_drop0.5_20251018_092601.h5,0.9846296906471252,0.049697473645210266
model_32-16_drop0.5_20251018_091545.h5,0.9692594408988953,0.0849156305193901
model_16-8_drop0.5_20251018_091558.h5,0.9734513163566589,0.07632456719875336
```

Confusion Matrices :

```
Model : model 16-8-4 drop0.5 20251018 092556
,Pred_0,Pred_1
Actual_0,983,7
Actual_1,267,890


Model : model 32-16-8 drop0.5 20251018 092553
,Pred_0,Pred_1
Actual_0,985,5
Actual_1,50,1107


Model : model 16-8 drop0.5 20251018 092601
,Pred_0,Pred_1
Actual_0,987,3
Actual_1,30,1127


Model : model 32-16 drop0.5 20251018 091545
,Pred_0,Pred_1
Actual_0,985,5
Actual_1,61,1096


Model : model 16-8 drop0.5 20251018 091558
,Pred_0,Pred_1
Actual_0,981,9
Actual_1,48,1109
```