



# Good-Bad Road Classifier

Offered by [bumuthu](#) on Fiverr



# Model Architectures

Each model have been trained transfer learning method freezing first 5 layers

# VGG19



Layer (type)	Output Shape	Param #
vgg16 (Model)	(None, 7, 7, 512)	14714688
flatten_3 (Flatten)	(None, 25088)	0
dropout_6 (Dropout)	(None, 25088)	0
dense_9 (Dense)	(None, 1024)	25691136
dropout_7 (Dropout)	(None, 1024)	0
dense_10 (Dense)	(None, 1024)	1049600
dense_11 (Dense)	(None, 2)	2050
Total params: 41,457,474		
Trainable params: 41,344,898		
Non-trainable params: 112,576		

# Xception



Layer (type)	Output Shape	Param #
xception (Model)	(None, 10, 10, 2048)	20861480
flatten_1 (Flatten)	(None, 204800)	0
dropout_2 (Dropout)	(None, 204800)	0
dense_3 (Dense)	(None, 1024)	209716224
dropout_3 (Dropout)	(None, 1024)	0
dense_4 (Dense)	(None, 1024)	1049600
dense_5 (Dense)	(None, 2)	2050
Total params: 231,629,354		
Trainable params: 231,555,466		
Non-trainable params: 73,888		

# InceptionV3



Layer (type)	Output Shape	Param #
inception_v3 (Model)	(None, 8, 8, 2048)	21802784
flatten_2 (Flatten)	(None, 131072)	0
dropout_4 (Dropout)	(None, 131072)	0
dense_6 (Dense)	(None, 1024)	134218752
dropout_5 (Dropout)	(None, 1024)	0
dense_7 (Dense)	(None, 1024)	1049600
dense_8 (Dense)	(None, 2)	2050
Total params: 157,073,186		
Trainable params: 157,028,642		
Non-trainable params: 44,544		

# ResNet50



Layer (type)	Output Shape	Param #
resnet50 (Model)	(None, 7, 7, 2048)	23587712
flatten (Flatten)	(None, 100352)	0
dropout (Dropout)	(None, 100352)	0
dense (Dense)	(None, 1024)	102761472
dropout_1 (Dropout)	(None, 1024)	0
dense_1 (Dense)	(None, 1024)	1049600
dense_2 (Dense)	(None, 2)	2050
Total params: 127,400,834		
Trainable params: 127,338,114		
Non-trainable params: 62,720		

# InceptionResNetV2



Layer (type)	Output Shape	Param #
inception_resnet_v2 (Model)	(None, 8, 8, 1536)	54336736
flatten_5 (Flatten)	(None, 98304)	0
dropout_10 (Dropout)	(None, 98304)	0
dense_15 (Dense)	(None, 1024)	100664320
dropout_11 (Dropout)	(None, 1024)	0
dense_16 (Dense)	(None, 1024)	1049600
dense_17 (Dense)	(None, 2)	2050
Total params: 156,052,706		
Trainable params: 155,982,050		
Non-trainable params: 70,656		



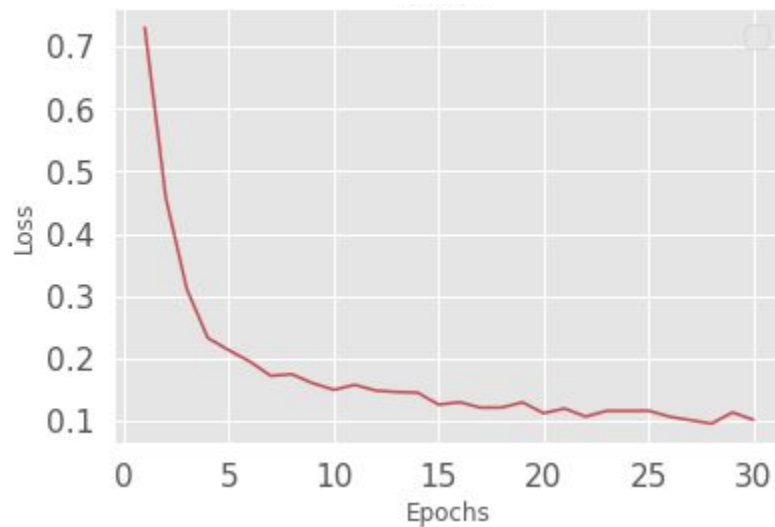
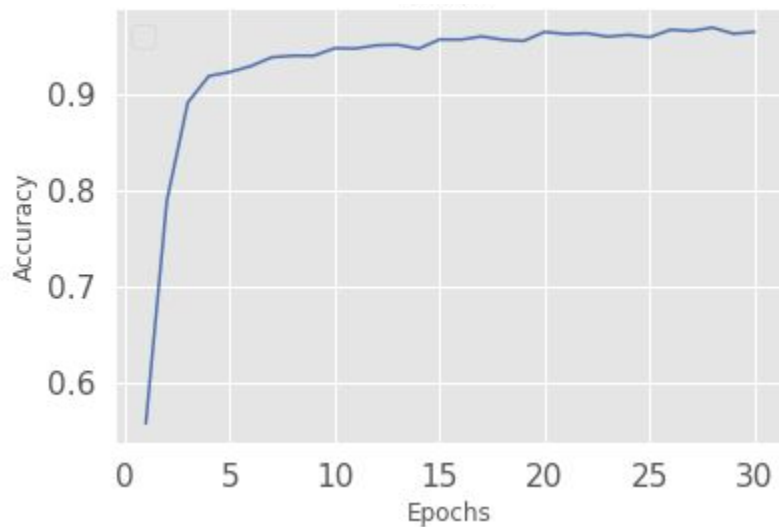
# Accuracy & Loss over epochs

Each model have been trained for 30 epochs



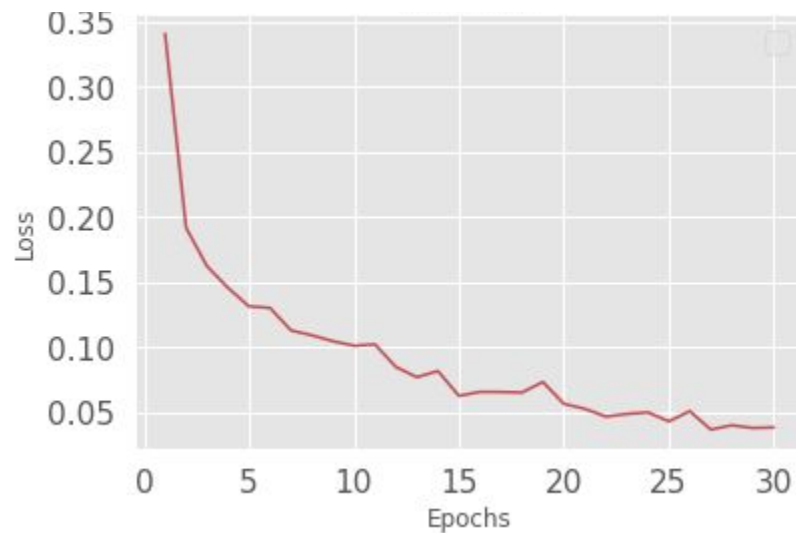
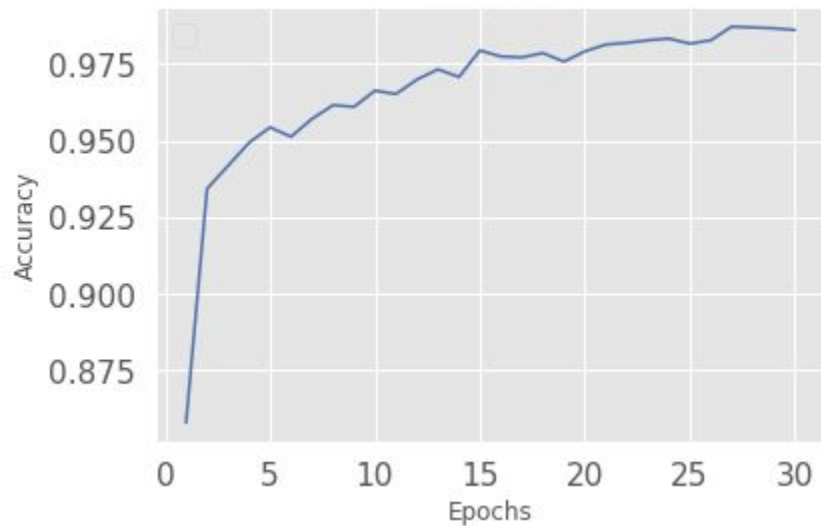
# VGG19

Training Accuracy & Loss over epochs



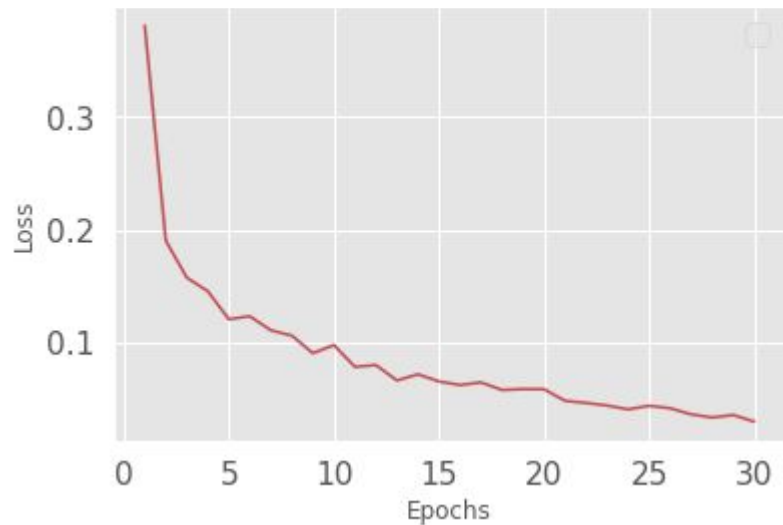
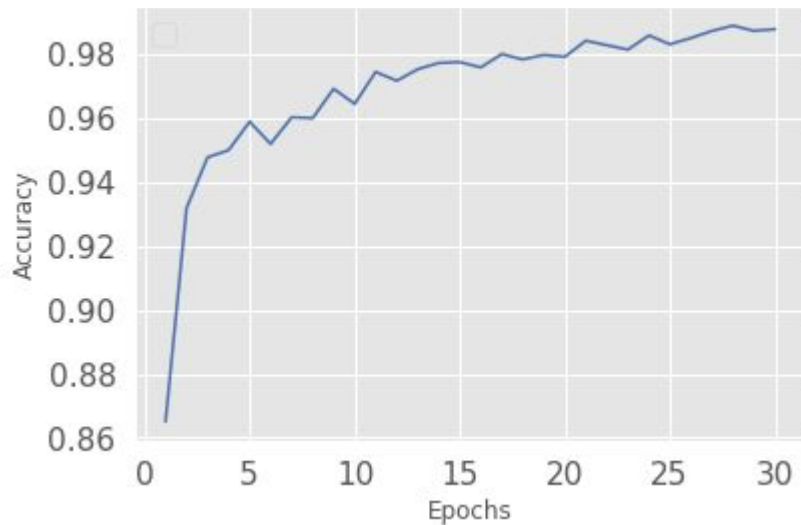
# Xception

Training Accuracy & Loss over epochs



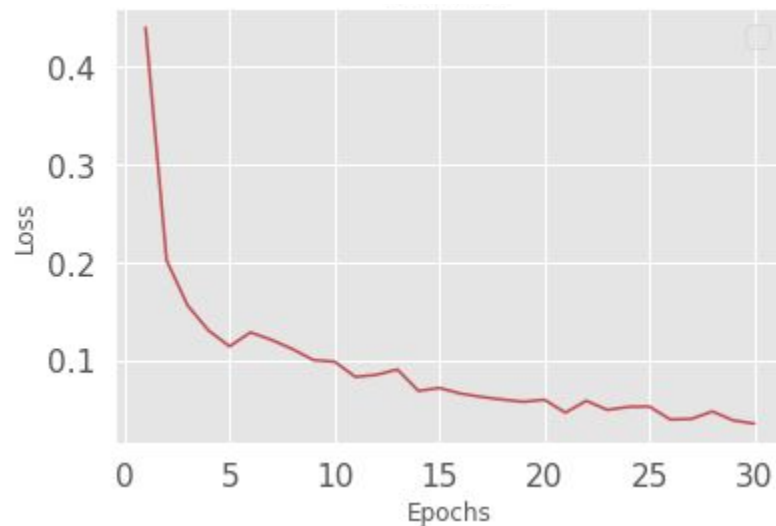
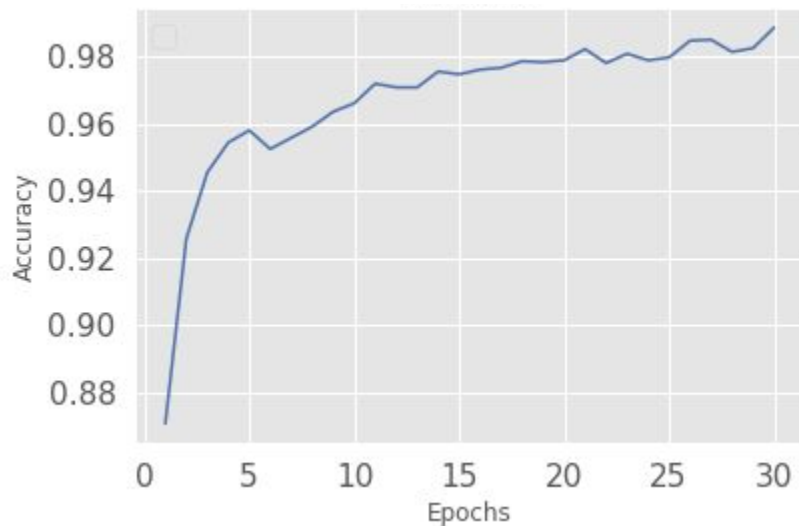
# InceptionV3

Training Accuracy & Loss over epochs



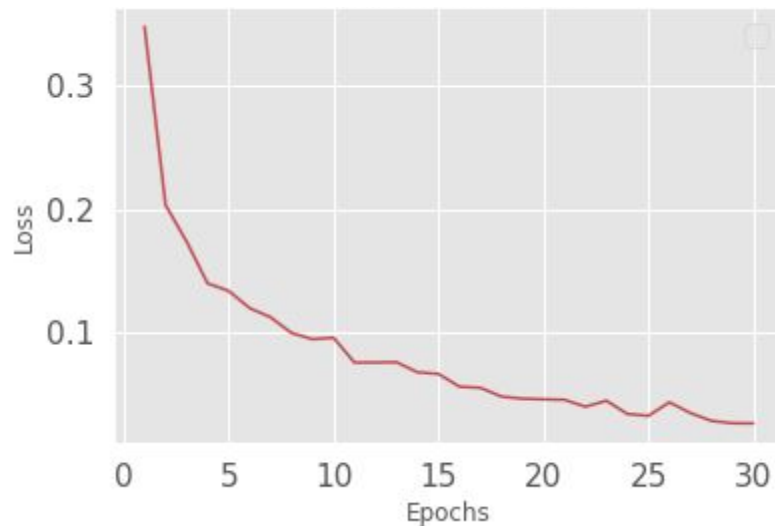
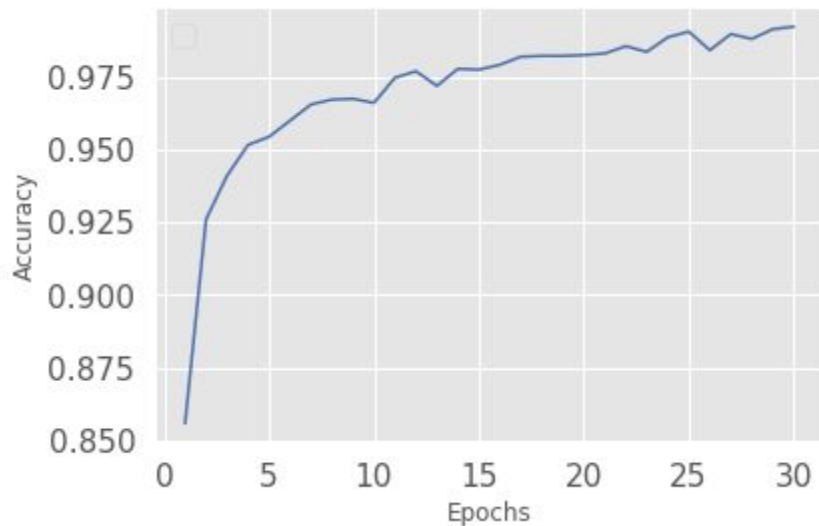
# ResNet50

Training Accuracy & Loss over epochs

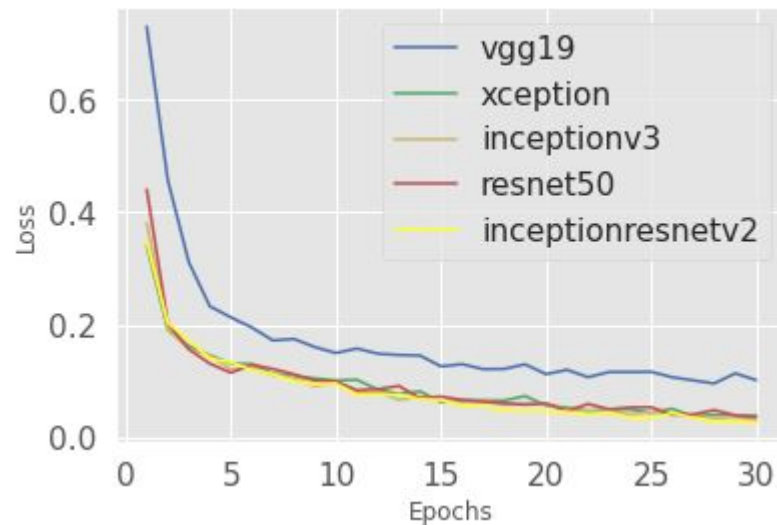
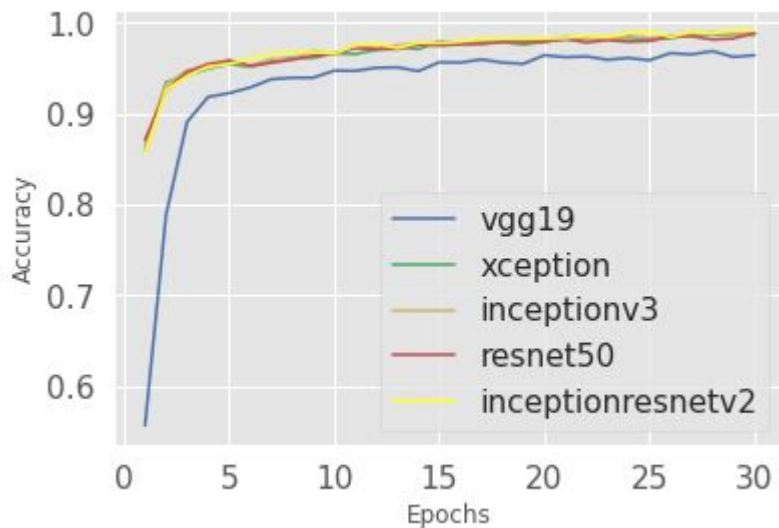


# InceptionResNetV2

Training Accuracy & Loss over epochs



# Comparison between models

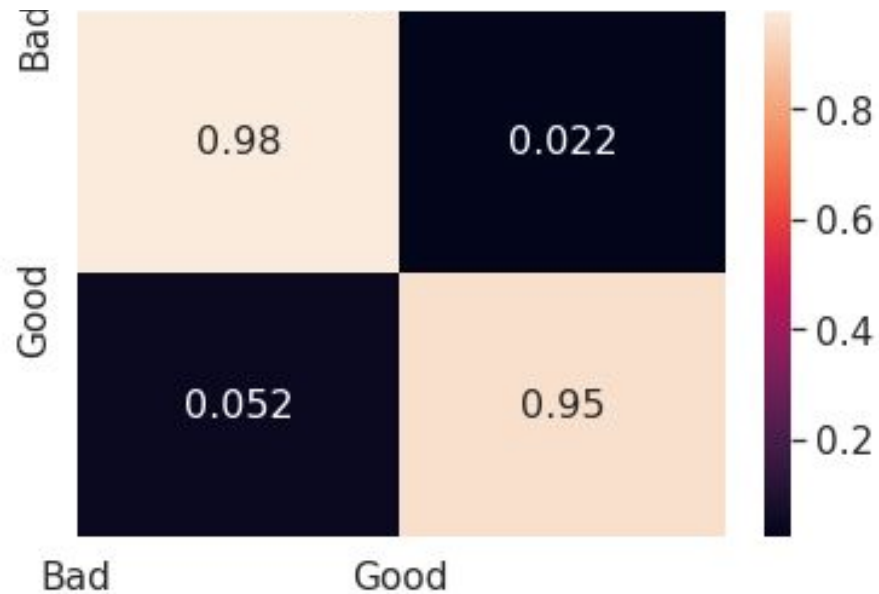




# Confusion Matrix

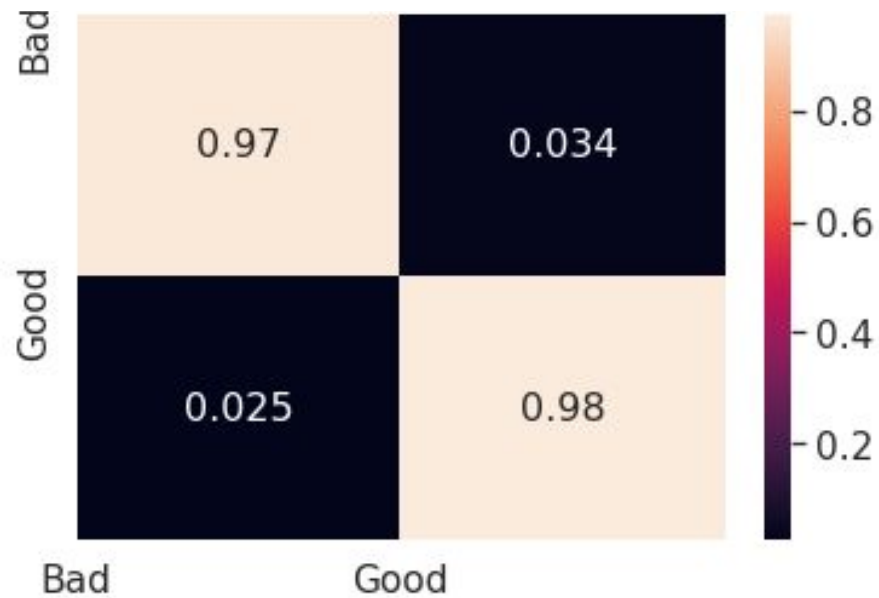
## for Validation data

# VGG19

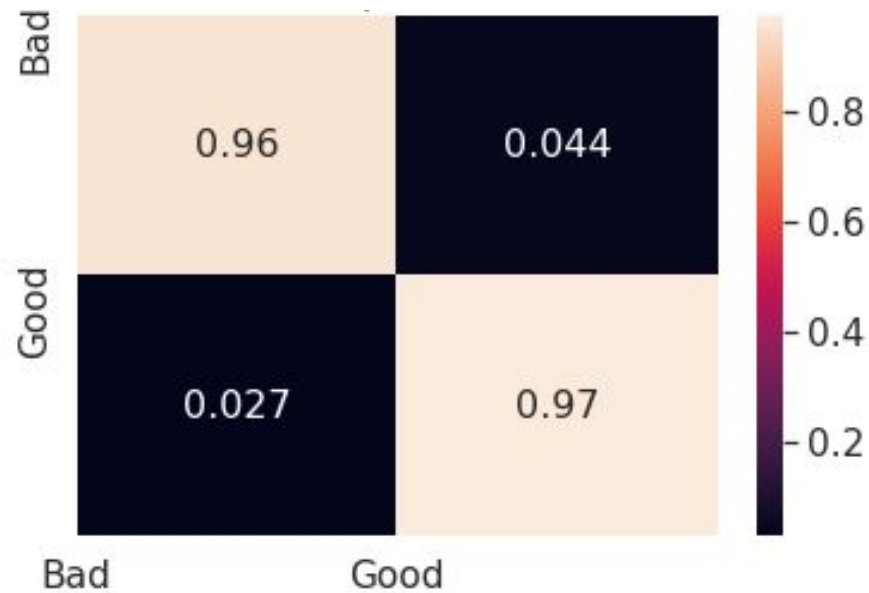




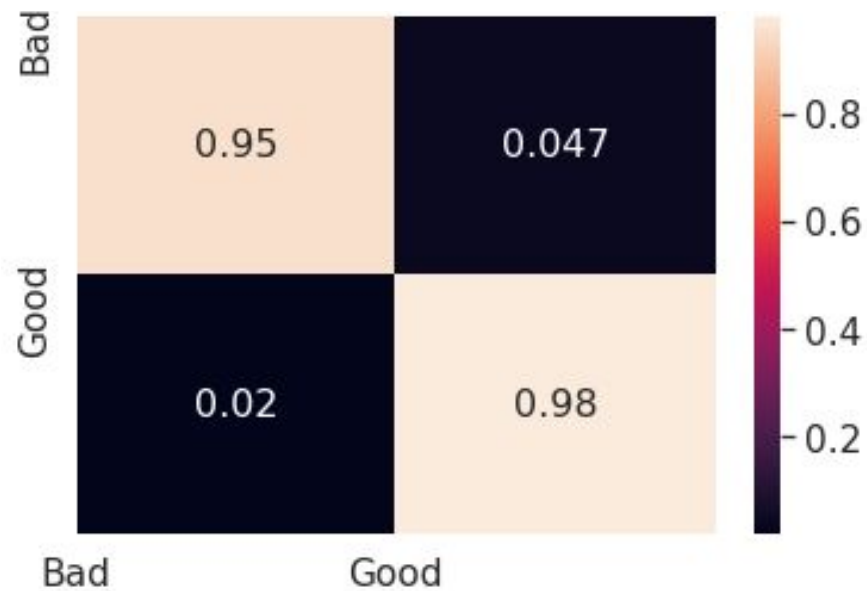
# Xception



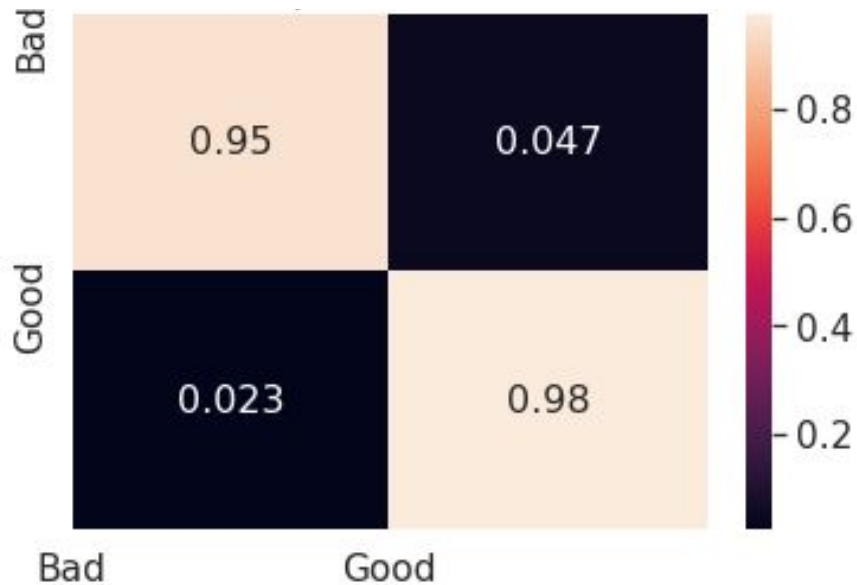
# InceptionV3



# ResNet50



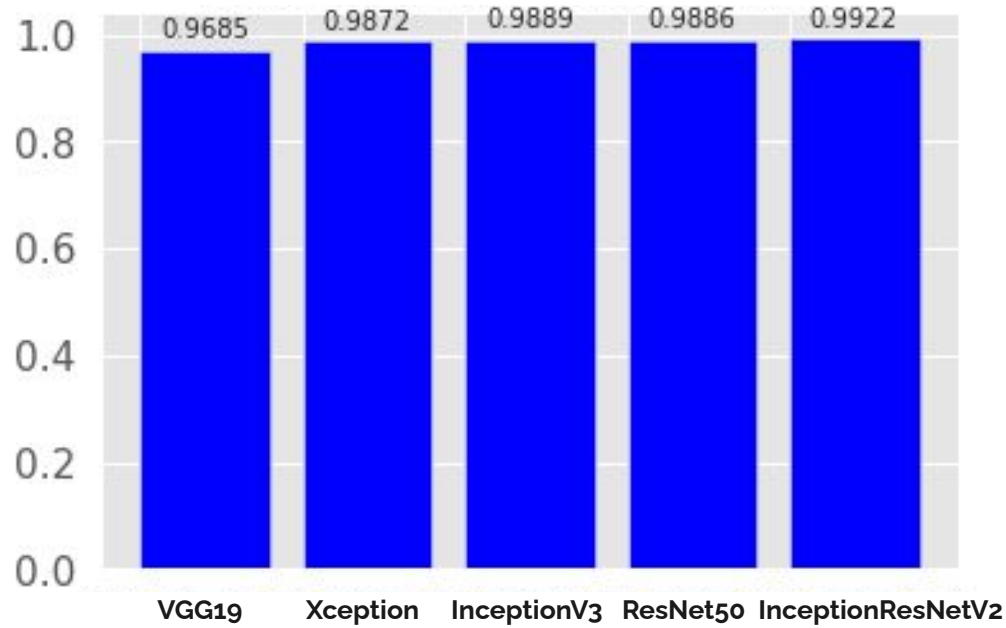
# InceptionResNetV2



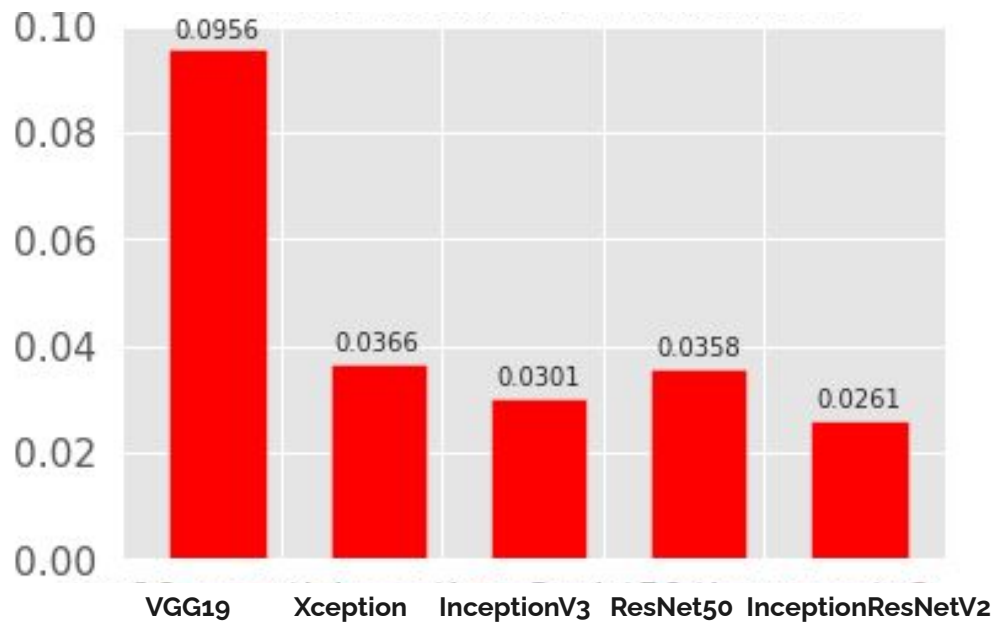


# Accuracy & Loss Comparison

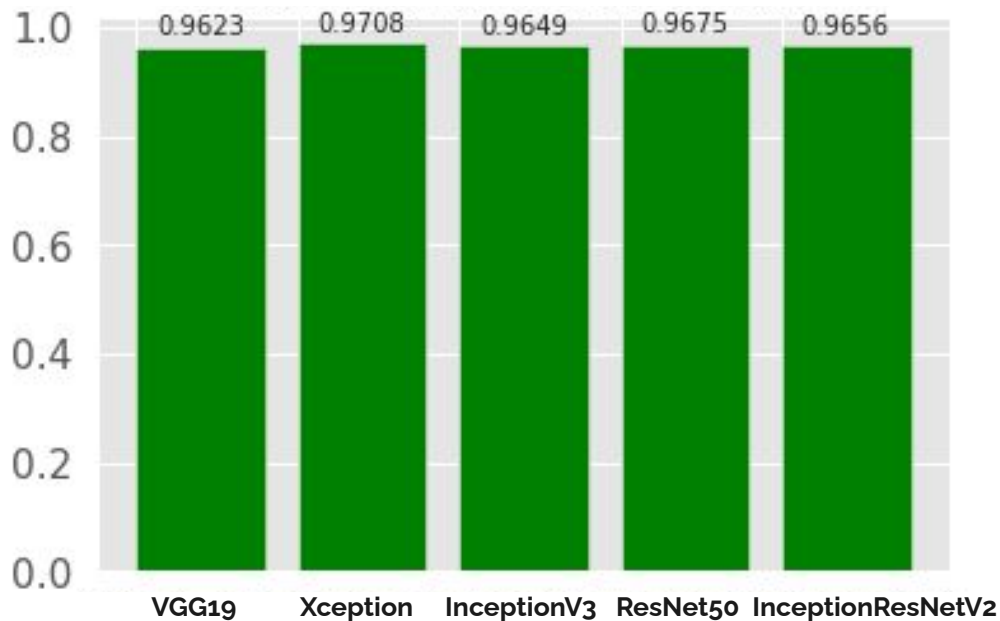
# Maximum training accuracy comparison



# Minimum training loss comparison

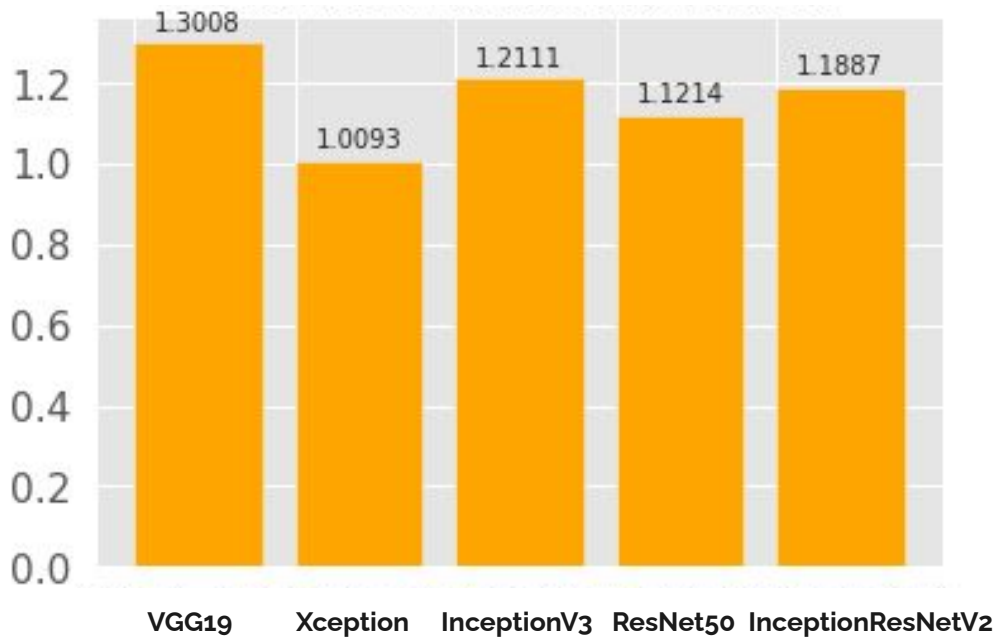


# Validation accuracy comparison





# Validation loss comparison





**Thank You**