Project goal: to create a model that is able to identify the artist behind various famous artworks. This project is a first step in the process of eventually learning to train models to evaluate artwork and identify forgery.
I have strayed from the dataset that I mentioned in my project proposal, and I am instead using a dataset of Impressionist artworks. The model should classify into the following categories (Impressionist artists): Cezanne, Degas, Gauguin, Hassam, Matisse, Monet, Pissarro, Renoir, Sargent, and VanGogh.

Below is a screenshot of the progress across epochs after fitting my original model (without a pretrained model):

```
model = keras.applications.Xception(weights=None, input_shape=(256, 256, 3), classes=10)
model.compile(optimizer='rmsprop', loss='categorical_crossentropy')
#model.fit(train_ds, epochs=10, validation_data=validation_ds)
```

```
Found 3988 files belonging to 10 classes.
Found 990 files belonging to 10 classes.
Epoch 1/10
125/125 [==============================] - 1346s 11s/step - loss: 2.4114 - val_loss: 2.2975
Epoch 2/10
125/125 [==============================] - 1137s 9s/step - loss: 2.0313 - val_loss: 2.1797
Epoch 3/10
125/125 [==============================] - 1093s 9s/step - loss: 1.8592 - val_loss: 2.2842
Epoch 4/10
125/125 [==============================] - 1097s 9s/step - loss: 1.6943 - val_loss: 11.5825
Epoch 5/10
125/125 [==============================] - 1103s 9s/step - loss: 1.5473 - val_loss: 3.1106
Epoch 6/10
125/125 [==============================] - 1103s 9s/step - loss: 1.4071 - val_loss: 2.6519
Epoch 7/10
125/125 [==============================] - 1089s 9s/step - loss: 1.2571 - val_loss: 10.8543
Epoch 8/10
125/125 [==============================] - 1103s 9s/step - loss: 1.1189 - val_loss: 3.1330
Epoch 9/10
125/125 [==============================] - 1093s 9s/step - loss: 0.9440 - val_loss: 3.1456
Epoch 10/10
125/125 [==============================] - 1091s 9s/step - loss: 0.7840 - val_loss: 3.8931
```

The loss was minimized to 0.78

Now here is the progress across epochs after fitting a model using the pretrained ResNet50 model for transfer learning:

```
model.fit(train_ds,epochs=10,validation_data=validation_ds)
```

```
Epoch 1/10
125/125 [==============================] - 383s 3s/step - loss: 4.1001 - accuracy: 0.4030 - val_loss: 1.9816 - val_ac
curacy: 0.4687
Epoch 2/10
125/125 [==============================] - 391s 3s/step - loss: 0.8616 - accuracy: 0.7460 - val_loss: 1.7853 - val_ac
curacy: 0.5707
Epoch 3/10
125/125 [==============================] - 1348s 11s/step - loss: 0.4235 - accuracy: 0.8653 - val_loss: 2.1048 - val_
accuracy: 0.5414
Epoch 4/10
125/125 [==============================] - 378s 3s/step - loss: 0.1979 - accuracy: 0.9353 - val_loss: 2.0977 - val_ac
curacy: 0.5758
Epoch 5/10
125/125 [==============================] - 378s 3s/step - loss: 0.1272 - accuracy: 0.9574 - val_loss: 2.2173 - val_ac
curacy: 0.5889
Epoch 6/10
125/125 [==============================] - 380s 3s/step - loss: 0.0860 - accuracy: 0.9747 - val_loss: 2.3518 - val_ac
curacy: 0.5848
Epoch 7/10
125/125 [==============================] - 378s 3s/step - loss: 0.0745 - accuracy: 0.9777 - val_loss: 2.5421 - val_ac
curacy: 0.6111
Epoch 8/10
125/125 [==============================] - 401s 3s/step - loss: 0.0675 - accuracy: 0.9799 - val_loss: 2.7811 - val_ac
curacy: 0.5697
Epoch 9/10
125/125 [==============================] - 430s 3s/step - loss: 0.1235 - accuracy: 0.9589 - val_loss: 2.9279 - val_ac
curacy: 0.6071
Epoch 10/10
125/125 [==============================] - 430s 3s/step - loss: 0.1890 - accuracy: 0.9486 - val_loss: 3.4913 - val_ac
curacy: 0.5505
```

The loss was minimized to ~ 0.19
Moving forward, I would like to evaluate/analyze the performance of the models to find where we could improve and where the models struggle to distinguish between artists