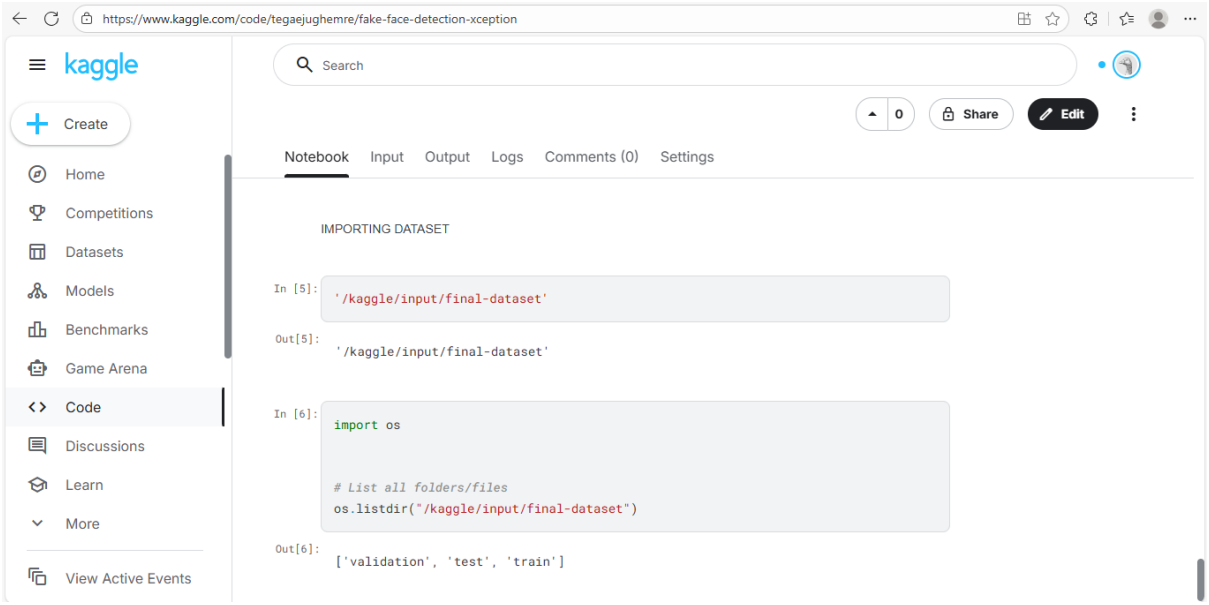
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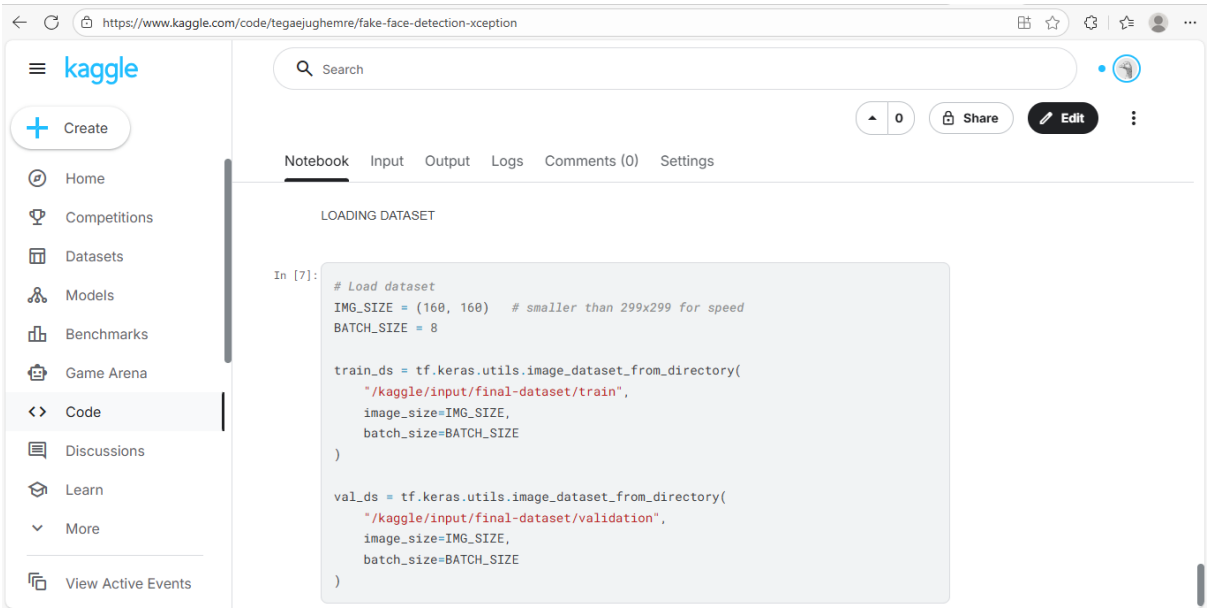
IMPORTING DATASET
In [5]:
'/kaggle/input/final-dataset'
Out[5]:
'/kaggle/input/final-dataset'
In [6]:
import os
# List all folders/files
os.listdir("/kaggle/input/final-dataset")
Out[6]:
['validation', 'test', 'train']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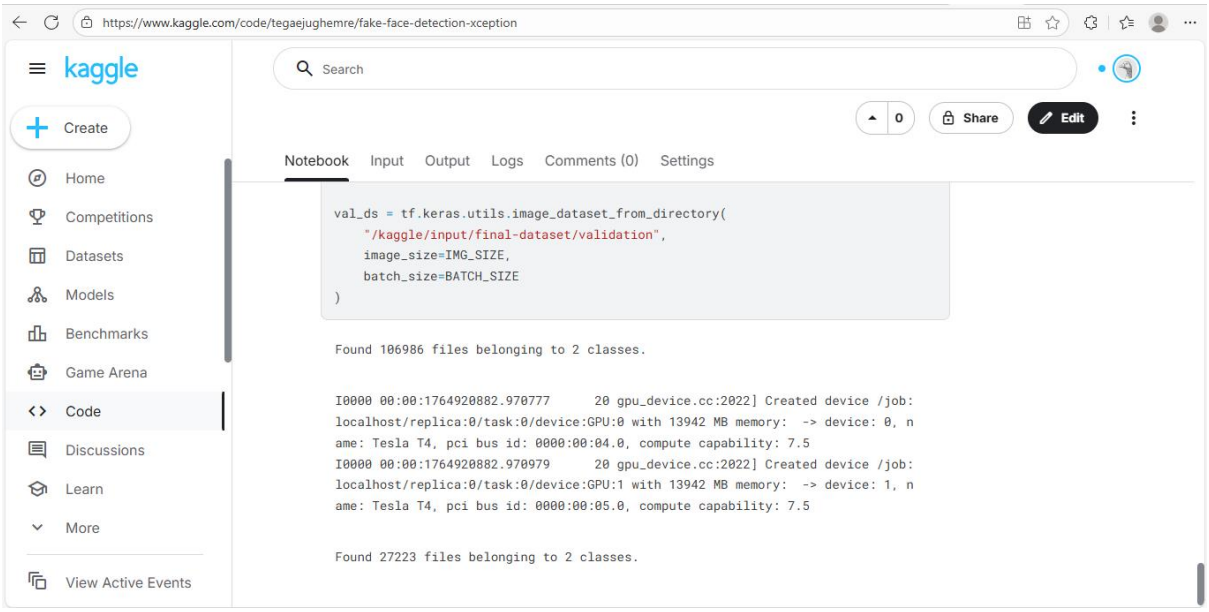
LOADING DATASET
In [7]:
# Load dataset
IMG_SIZE = (160, 160) # smaller than 299x299 for speed
BATCH_SIZE = 8
train_ds = tf.keras.utils.image_dataset_from_directory(
"/kaggle/input/final-dataset/train",
image_size=IMG_SIZE,
batch_size=BATCH_SIZE
)
val_ds = tf.keras.utils.image_dataset_from_directory(
"/kaggle/input/final-dataset/validation",
image_size=IMG_SIZE,
batch_size=BATCH_SIZE
)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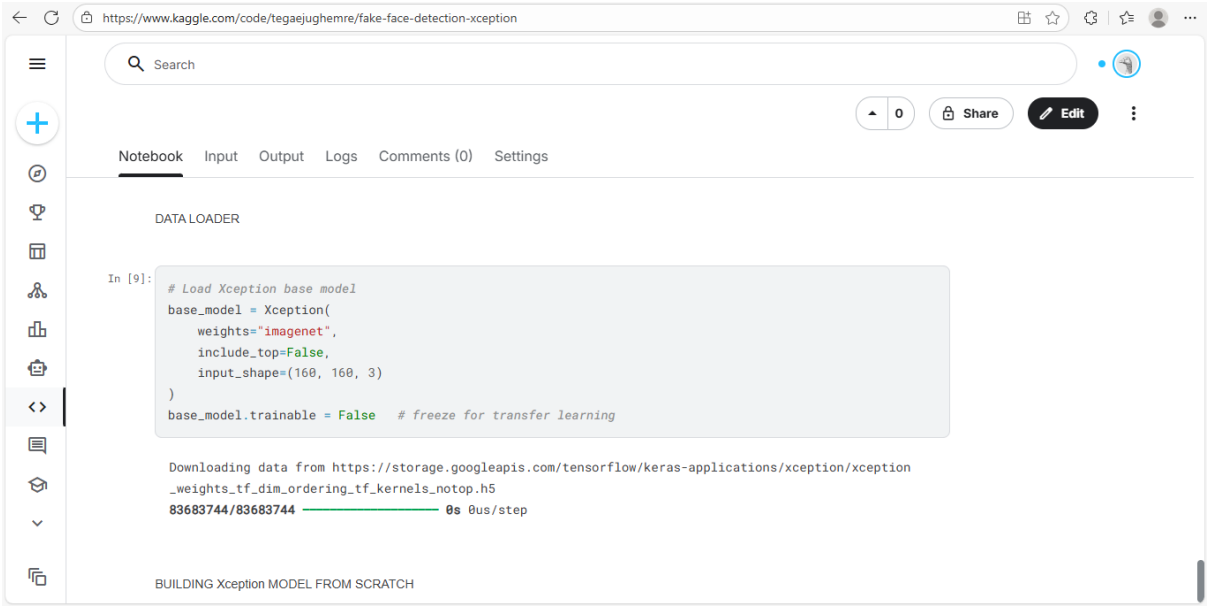
val_ds = tf.keras.utils.image_dataset_from_directory(
"/kaggle/input/final-dataset/validation",
image_size=IMG_SIZE,
batch_size=BATCH_SIZE
)
Found 106986 files belonging to 2 classes.
I0000 00:00:1764920882.970777 20 gpu_device.cc:2022] Created device /job:
localhost/replica:0/task:0/device:GPU:0 with 13942 MB memory: -> device: 0, n
ame: Tesla T4, pci bus id: 0000:00:04.0, compute capability: 7.5
I0000 00:00:1764920882.970979 20 gpu_device.cc:2022] Created device /job:
localhost/replica:0/task:0/device:GPU:1 with 13942 MB memory: -> device: 1, n
ame: Tesla T4, pci bus id: 0000:00:05.0, compute capability: 7.5
Found 27223 files belonging to 2 classes.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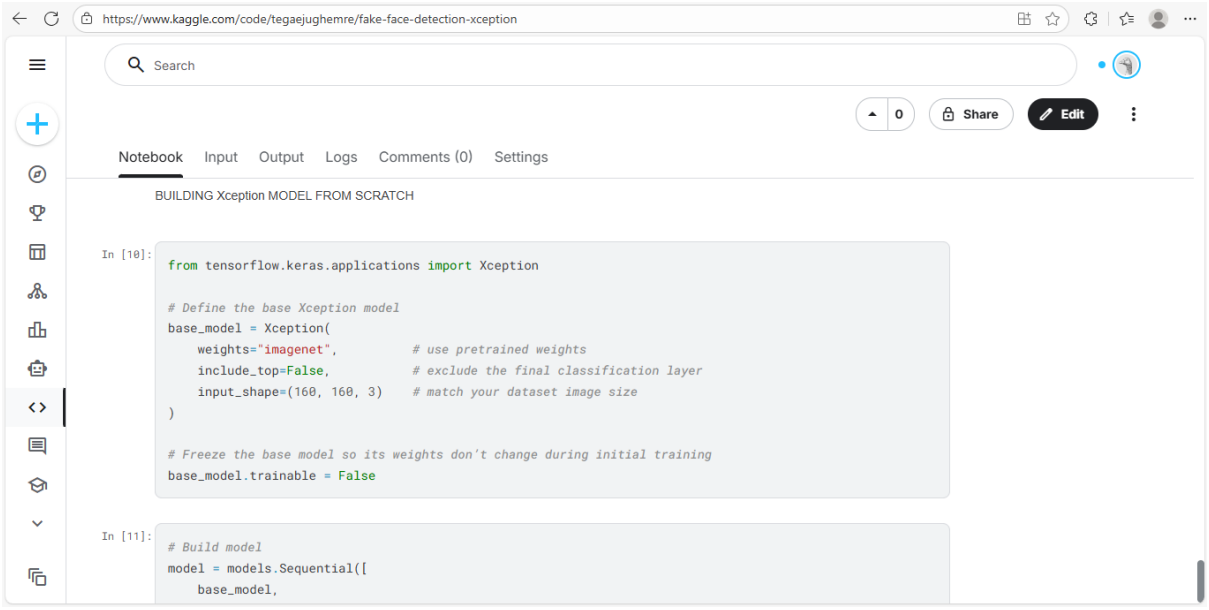
DATA LOADER
In [9]:
# Load Xception base model
base_model = Xception(
weights="imagenet",
include_top=False,
input_shape=(160, 160, 3)
)
base_model.trainable = False # freeze for transfer learning
Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/xception/xception
_weights_tf_dim_ordering_tf_kernels_notop.h5
83683744/83683744 0s 0us/step
BUILDING Xception MODEL FROM SCRATCH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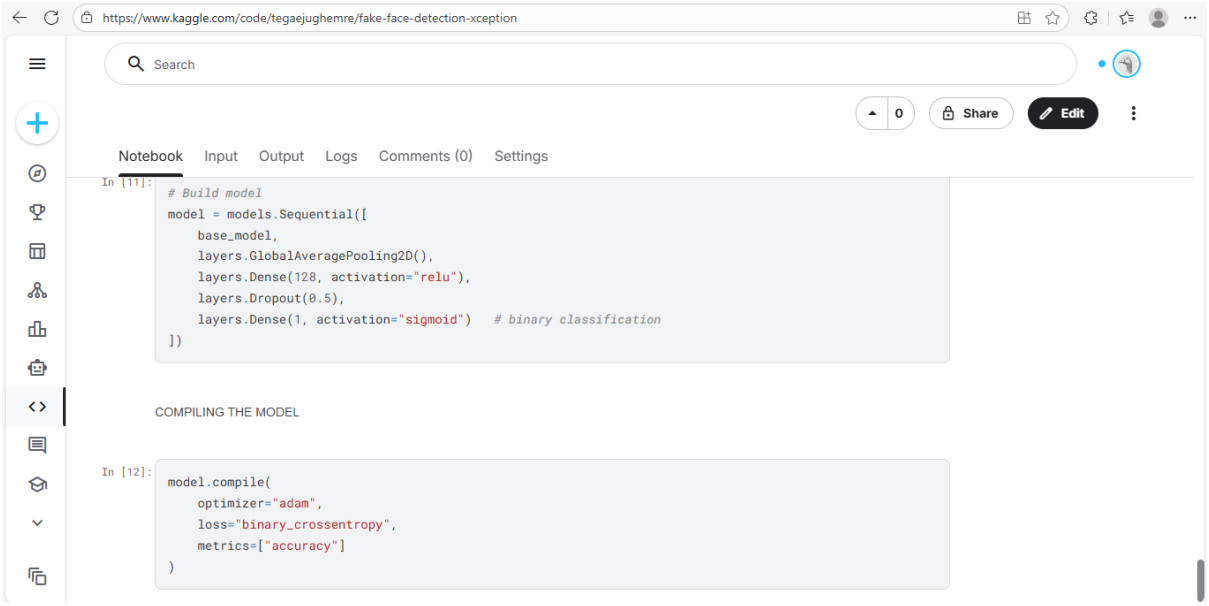
BUILDING Xception MODEL FROM SCRATCH
In [10]:
from tensorflow.keras.applications import Xception
# Define the base Xception model
base_model = Xception(
weights="imagenet", # use pretrained weights
include_top=False, # exclude the final classification layer
input_shape=(160, 160, 3) # match your dataset image size
)
# Freeze the base model so its weights don't change during initial training
base_model.trainable = False
In [11]:
# Build model
model = models.Sequential([
base_model,


https://www.kaggle.com/code/tegaejughemre/fake-face-detection-xception
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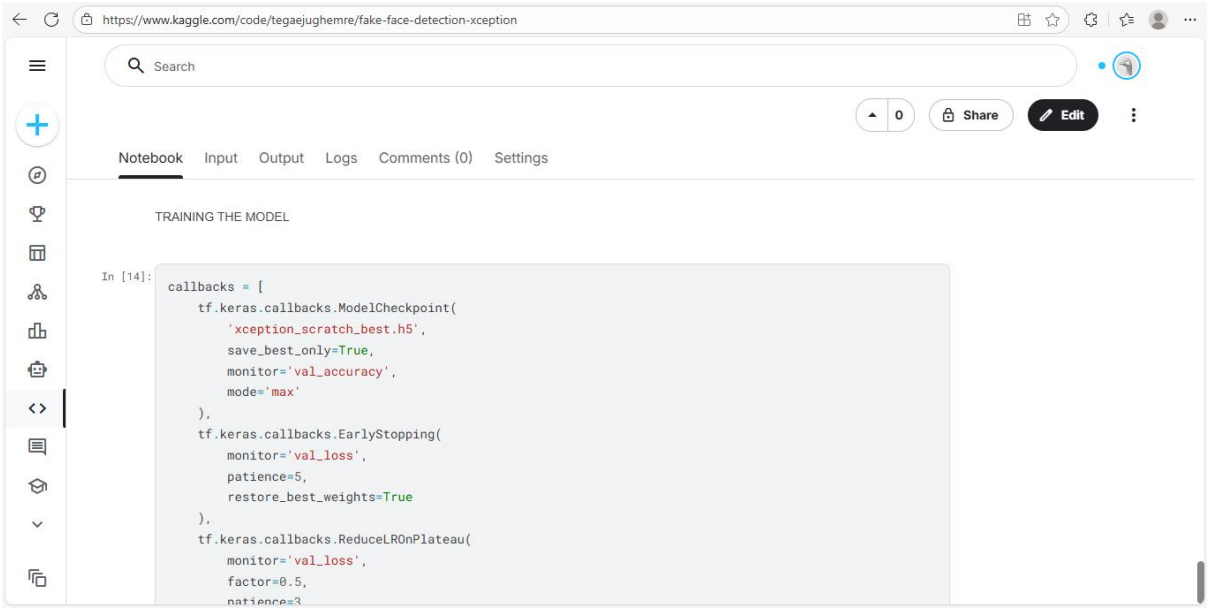
In [11]:
# Build model
model = models.Sequential([
base_model,
layers.GlobalAveragePooling2D(),
layers.Dense(128, activation="relu"),
layers.Dropout(0.5),
layers.Dense(1, activation="sigmoid") # binary classification
])
COMPILING THE MODEL
In [12]:
model.compile(
optimizer="adam",
loss="binary_crossentropy",
metrics=["accuracy"]
)


https://www.kaggle.com/code/tegaejughemre/fake-face-detection-xception
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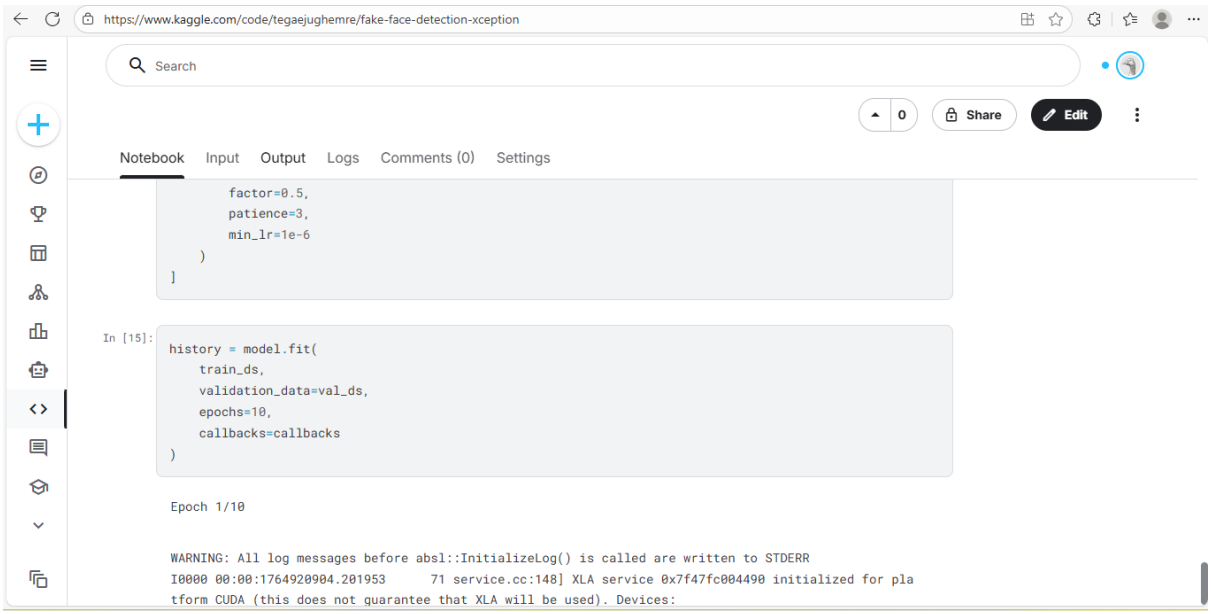
TRAINING THE MODEL
In [14]:
callbacks = [
tf.keras.callbacks.ModelCheckpoint(
'xception_scratch_best.h5',
save_best_only=True,
monitor='val_accuracy',
mode='max'
),
tf.keras.callbacks.EarlyStopping(
monitor='val_loss',
patience=5,
restore_best_weights=True
),
tf.keras.callbacks.ReduceLROnPlateau(
monitor='val_loss',
factor=0.5,


https://www.kaggle.com/code/tegaejughemre/fake-face-detection-xception
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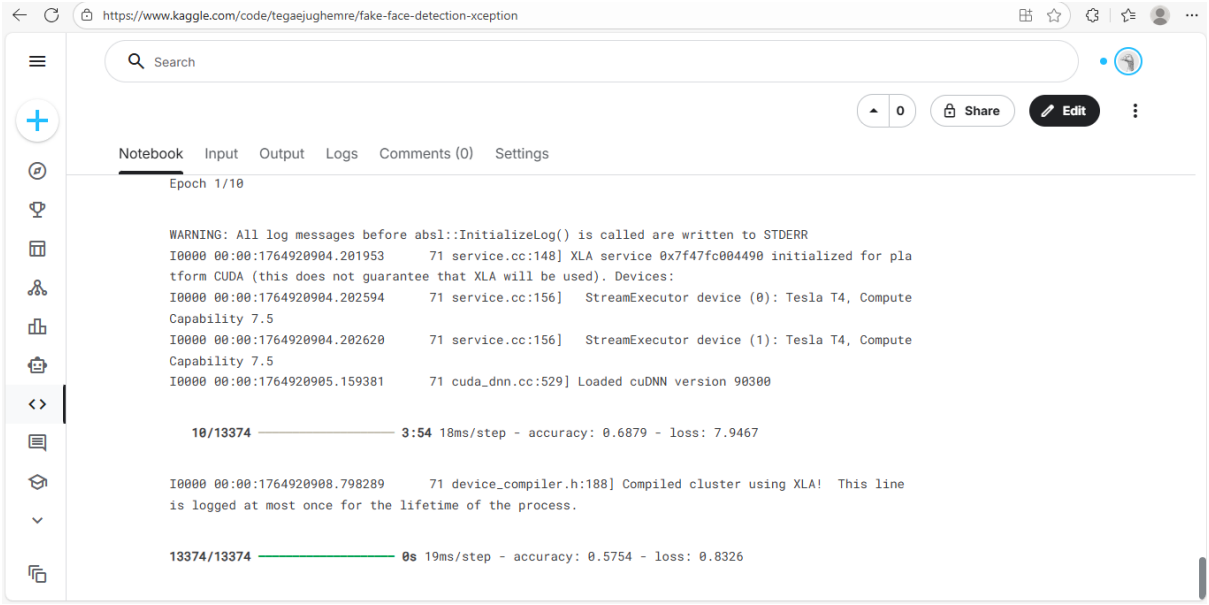
factor=0.5,
patience=3,
min_lr=1e-6
)
]
In [15]:
history = model.fit(
train_ds,
validation_data=val_ds,
epochs=10,
callbacks=callbacks
)
Epoch 1/10
WARNING: All log messages before absl::InitializeLog() is called are written to STDERR
I0000 00:00:1764920904.201953 71 service.cc:148] XLA service 0x7f47fc004490 initialized for pla
tform CUDA (this does not guarantee that XLA will be used). Devices:


https://www.kaggle.com/code/tegaejughemre/fake-face-detection-xception
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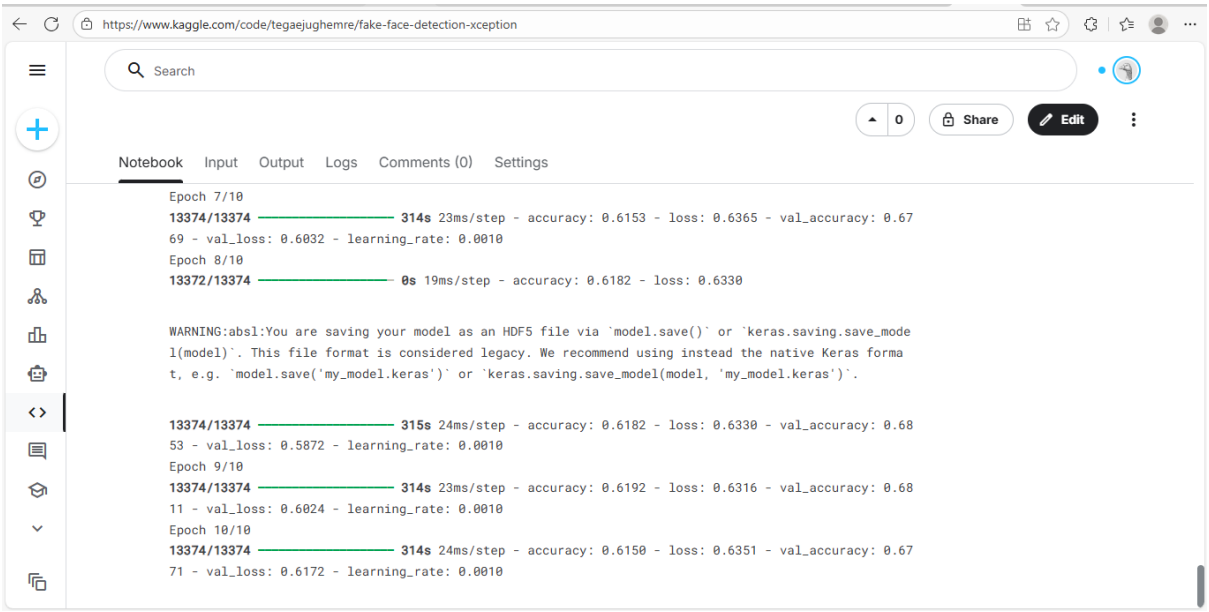
Epoch 1/10
WARNING: All log messages before absl::InitializeLog() is called are written to STDERR
I0000 00:00:1764920904.201953 71 service.cc:148] XLA service 0x7f47fc004490 initialized for pla
tform CUDA (this does not guarantee that XLA will be used). Devices:
I0000 00:00:1764920904.202594 71 service.cc:156] StreamExecutor device (0): Tesla T4, Compute
Capability 7.5
I0000 00:00:1764920904.202620 71 service.cc:156] StreamExecutor device (1): Tesla T4, Compute
Capability 7.5
I0000 00:00:1764920905.159381 71 cuda_dnn.cc:529] Loaded cuDNN version 90300
10/13374 3:54 18ms/step - accuracy: 0.6879 - loss: 7.9467
I0000 00:00:1764920908.798289 71 device_compiler.h:188] Compiled cluster using XLA! This line
is logged at most once for the lifetime of the process.
13374/13374 0s 19ms/step - accuracy: 0.5754 - loss: 0.8326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Epoch 7/10
13374/13374 314s 23ms/step - accuracy: 0.6153 - loss: 0.6365 - val_accuracy: 0.67
69 - val_loss: 0.6032 - learning_rate: 0.0010
Epoch 8/10
13372/13374 0s 19ms/step - accuracy: 0.6182 - loss: 0.6330
WARNING:absl:You are saving your model as an HDF5 file via `model.save()` or `keras.saving.save_mode
l(model)`. This file format is considered legacy. We recommend using instead the native Keras forma
t, e.g. `model.save('my_model.keras')` or `keras.saving.save_model(model, 'my_model.keras')`.
13374/13374 315s 24ms/step - accuracy: 0.6182 - loss: 0.6330 - val_accuracy: 0.68
53 - val_loss: 0.5872 - learning_rate: 0.0010
Epoch 9/10
13374/13374 314s 23ms/step - accuracy: 0.6192 - loss: 0.6316 - val_accuracy: 0.68
11 - val_loss: 0.6024 - learning_rate: 0.0010
Epoch 10/10
13374/13374 314s 24ms/step - accuracy: 0.6150 - loss: 0.6351 - val_accuracy: 0.67
71 - val_loss: 0.6172 - learning_rate: 0.0010

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HISTORY CURVES

In [16]:

```
import matplotlib.pyplot as plt

# Plot training & validation accuracy values
plt.figure(figsize=(12, 5))

# Accuracy
plt.subplot(1, 2, 1)
plt.plot(history.history['accuracy'], label='Train Accuracy')
plt.plot(history.history['val_accuracy'], label='Validation Accuracy')
plt.title('Model Accuracy')
plt.xlabel('Epoch')
plt.ylabel('Accuracy')
plt.legend(loc='lower right')

# Loss
plt.subplot(1, 2, 2)
```

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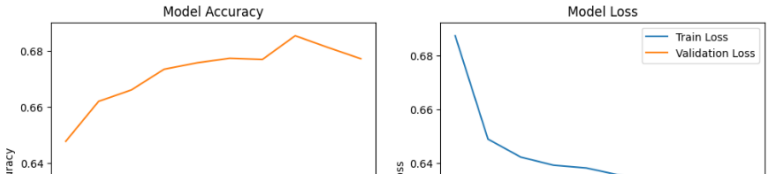
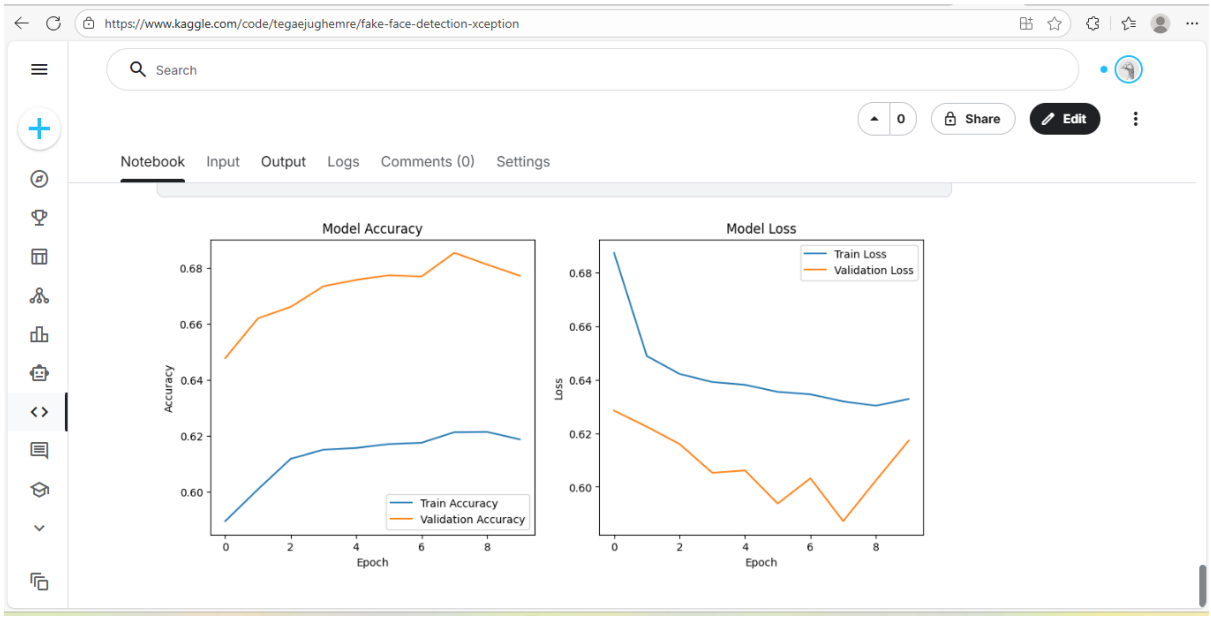
```
# Loss
plt.subplot(1, 2, 2)
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label='Validation Loss')
plt.title('Model Loss')
plt.xlabel('Epoch')
plt.ylabel('Loss')
plt.legend(loc='upper right')

plt.show()
```

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