Project Development Phase
Model Performance Test

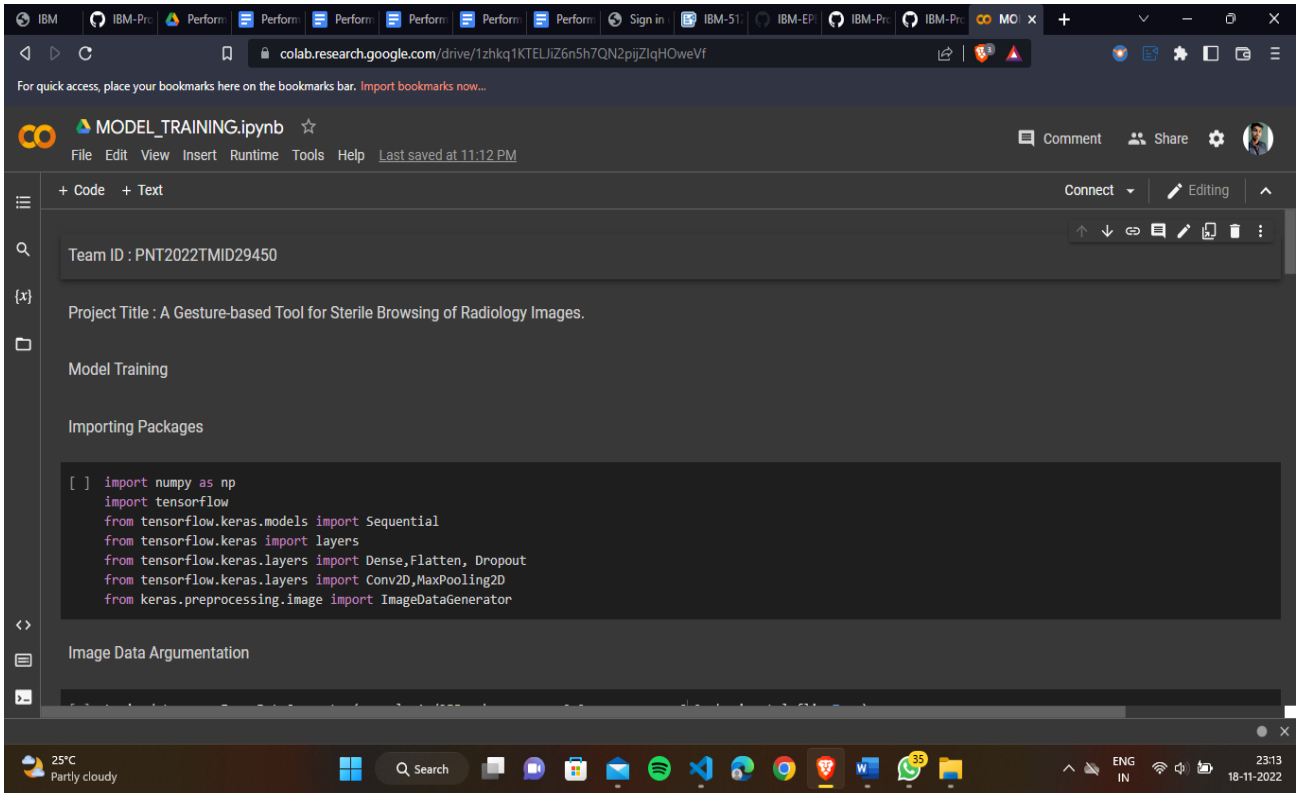
Date	18 November 2022
Team ID	PNT2022TMID29450
Project Name	A Gesture-based Tool for Sterile Browsing of Radiology Images
Maximum Marks	10 Marks

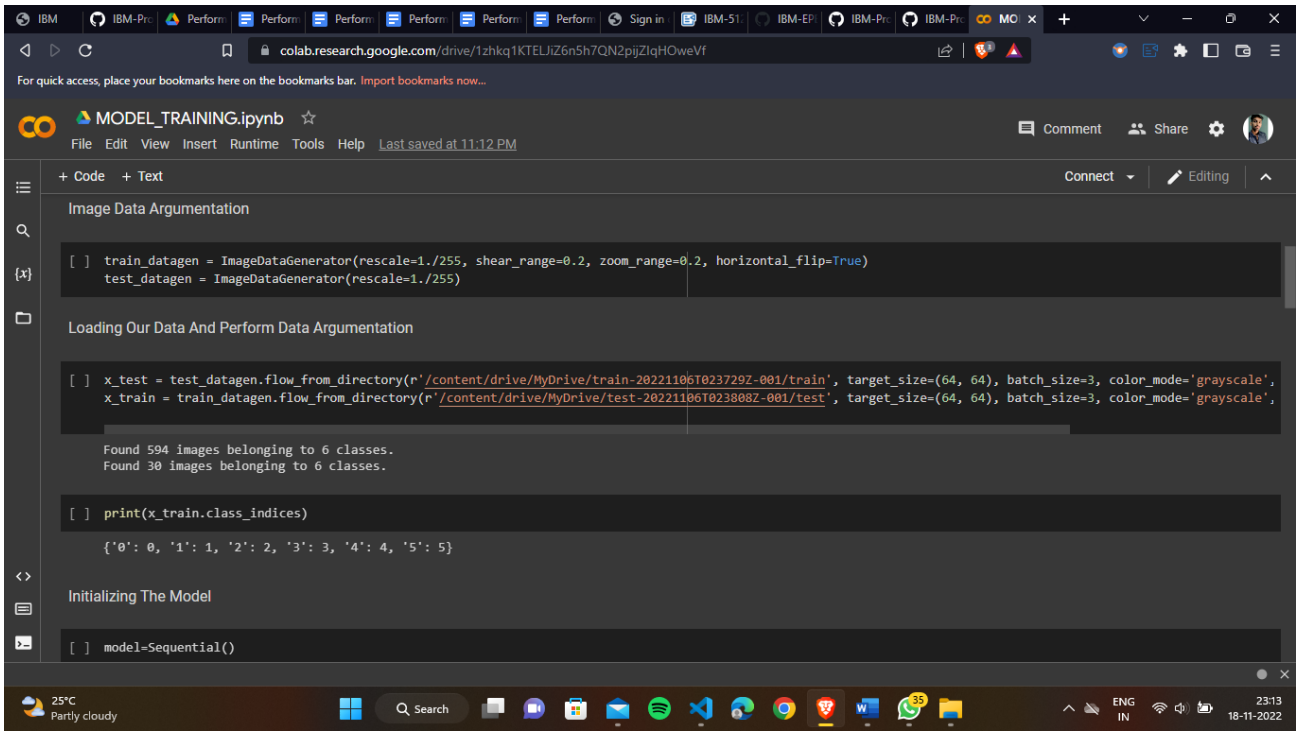
ModelPerformance Testing:

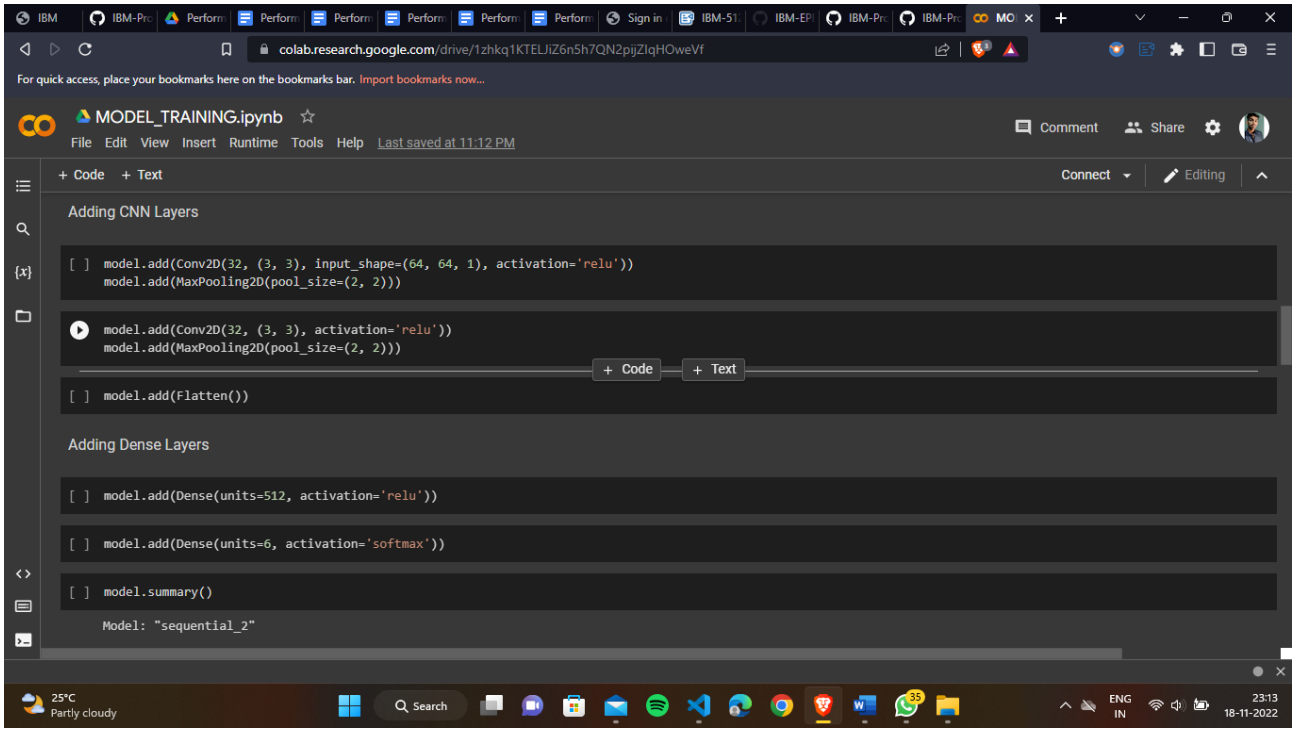
Project team shall fill the following information in model performance testing template.

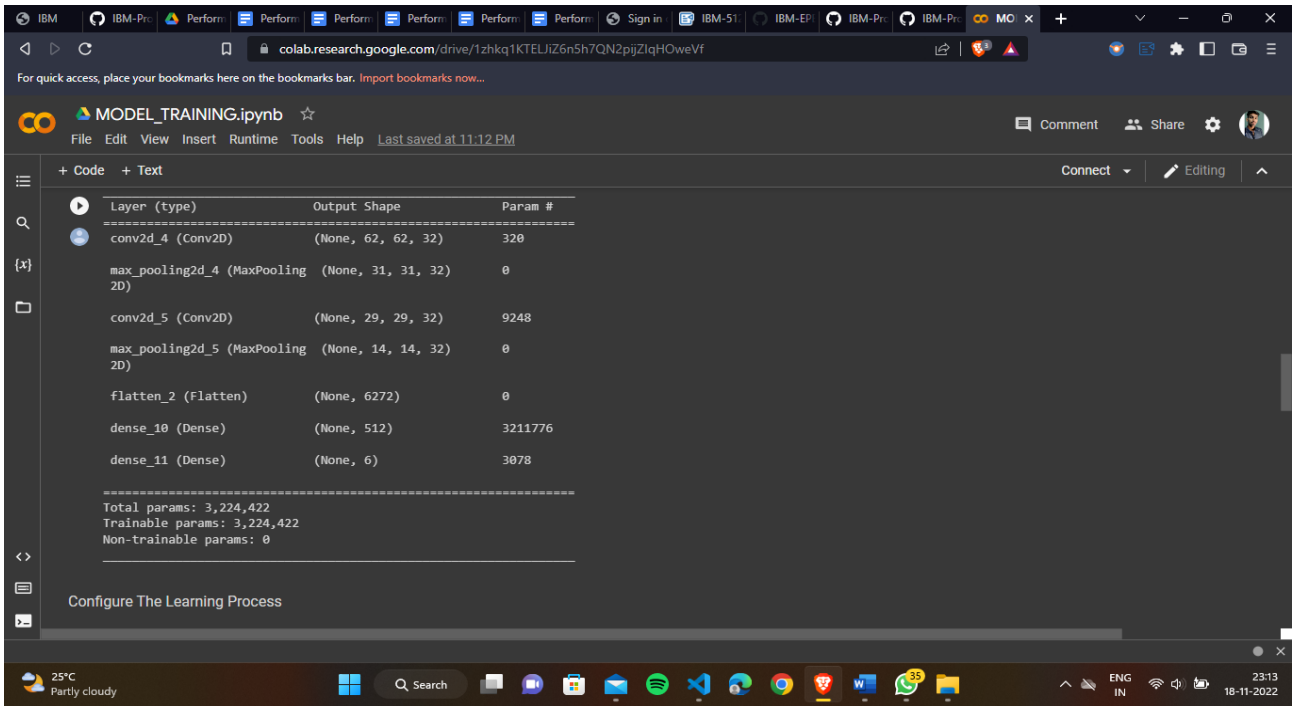
S.No.	Parameter	Values	Screenshot
1.	Model Summary	Total params: 3,224,422 Trainable params: 3,224,422 Non-trainable params: 0	Attached below
2.	Accuracy	Training Accuracy - 98% Validation Accuracy - 60%	Attached below

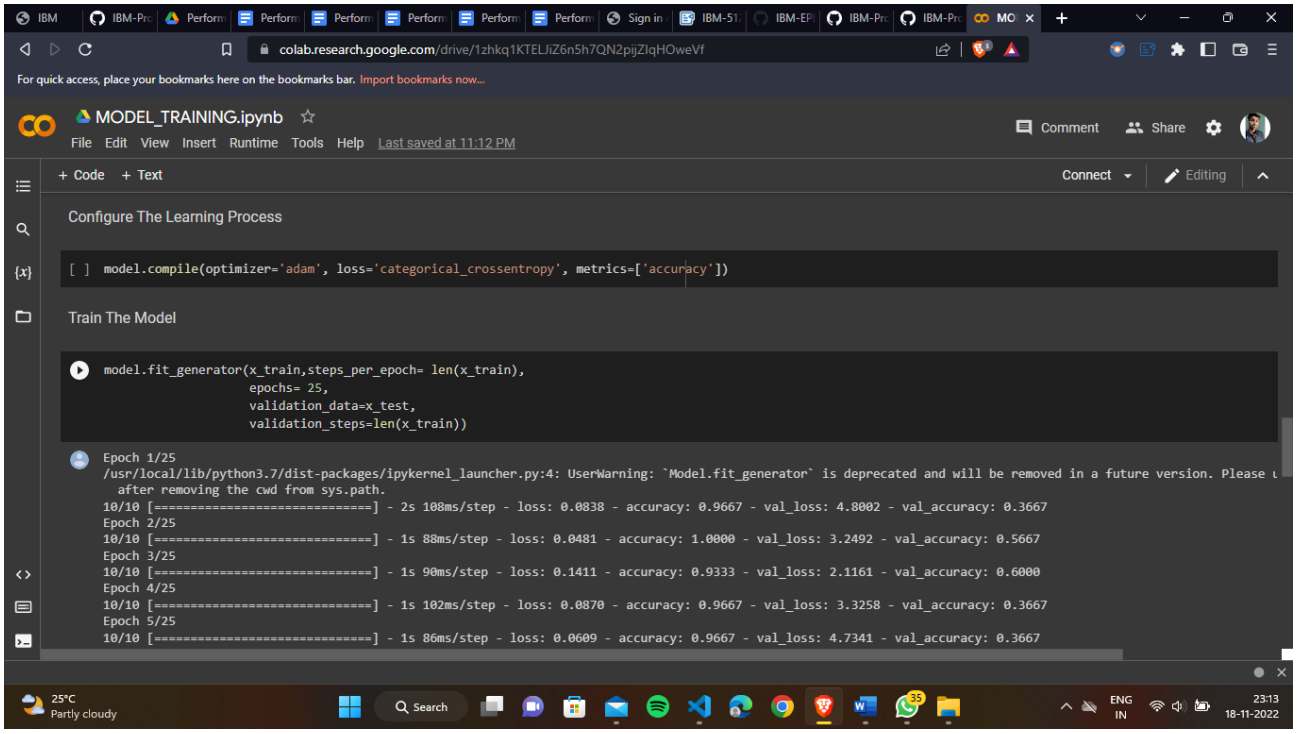
SCREENSHOTS :

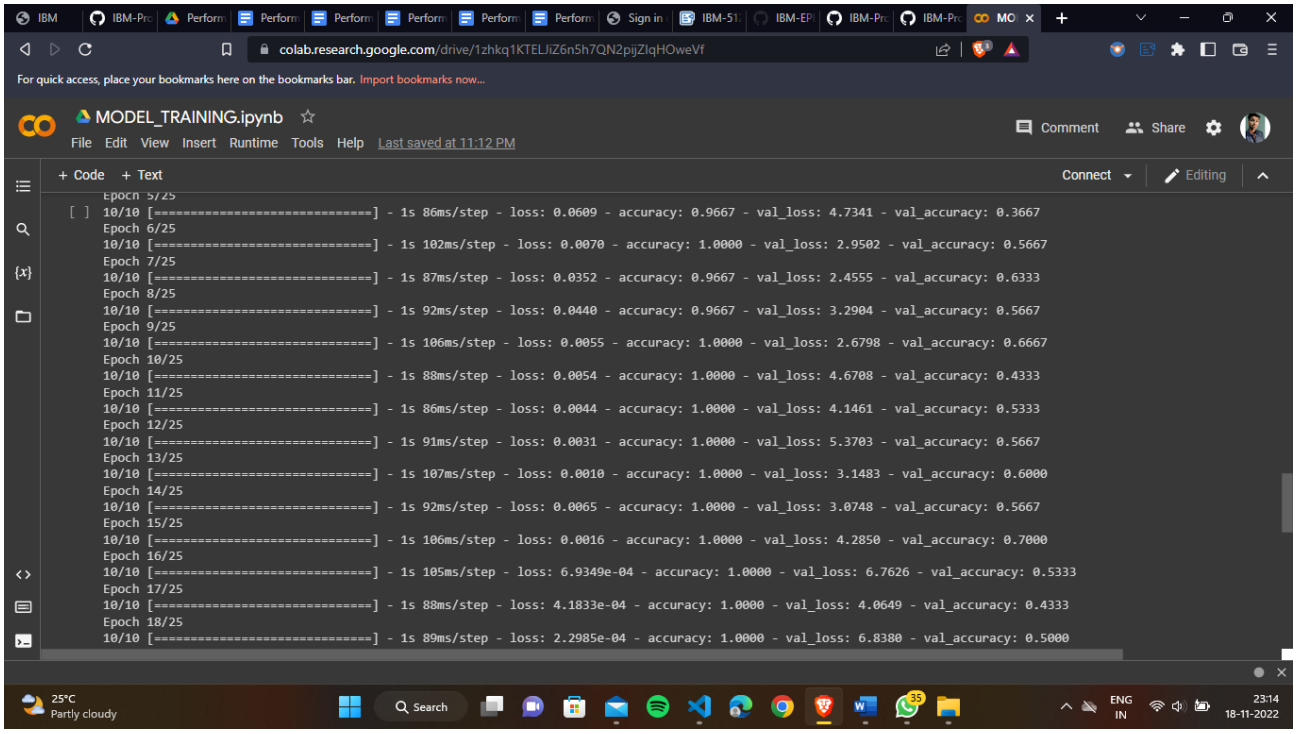

colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZIqHOweVf
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
Team ID : PNT2022TMID29450
Project Title : A Gesture-based Tool for Sterile Browsing of Radiology Images.
Model Training
Importing Packages
[ ] import numpy as np
import tensorflow
from tensorflow.keras.models import Sequential
from tensorflow.keras import layers
from tensorflow.keras.layers import Dense,Flatten, Dropout
from tensorflow.keras.layers import Conv2D,MaxPooling2D
from keras.preprocessing.image import ImageDataGenerator
Image Data Argumentation
25°C Partly cloudy
Search
ENG IN
23:13 18-11-2022

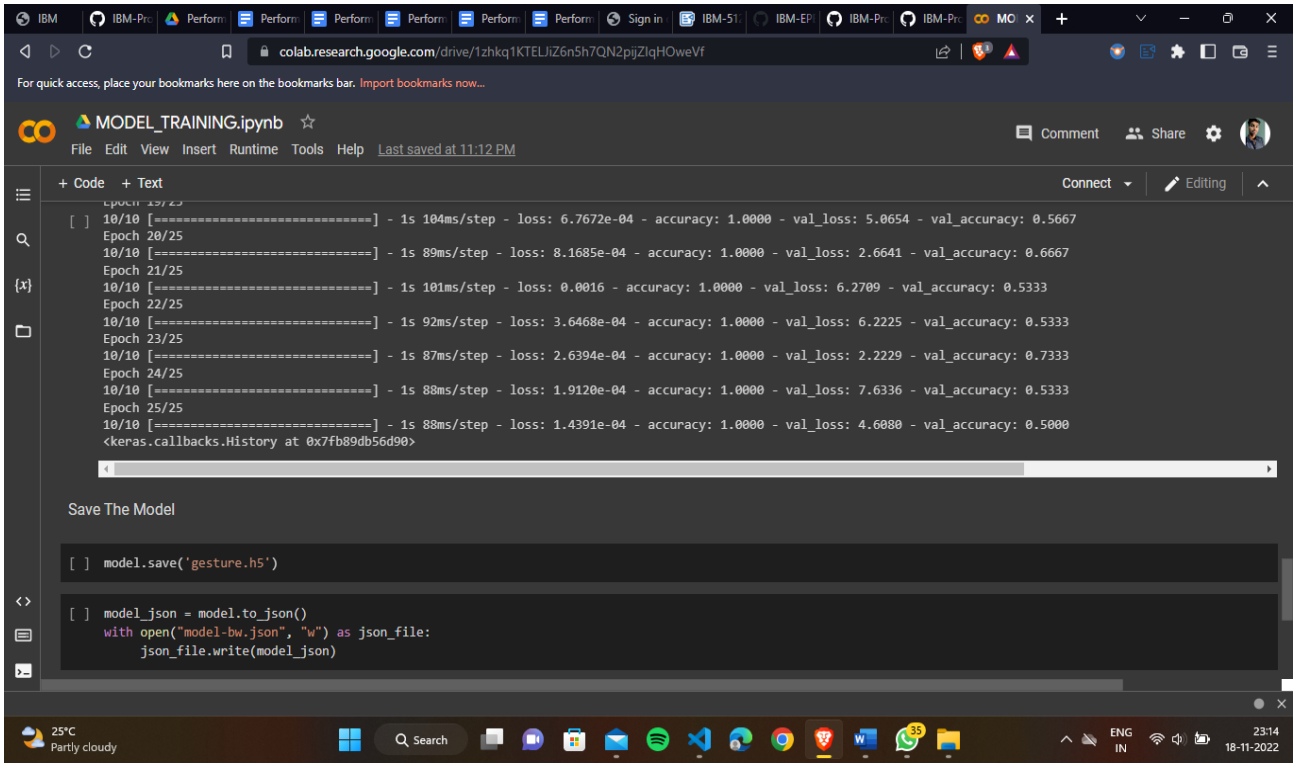

colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZIqHOweVf
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
Image Data Argumentation
[ ] train_datagen = ImageDataGenerator(rescale=1./255, shear_range=0.2, zoom_range=0.2, horizontal_flip=True)
test_datagen = ImageDataGenerator(rescale=1./255)
Loading Our Data And Perform Data Argumentation
[ ] x_test = test_datagen.flow_from_directory(r'/content/drive/MyDrive/train-20221106T023729Z-001/train', target_size=(64, 64), batch_size=3, color_mode='grayscale',
x_train = train_datagen.flow_from_directory(r'/content/drive/MyDrive/test-20221106T023808Z-001/test', target_size=(64, 64), batch_size=3, color_mode='grayscale',
Found 594 images belonging to 6 classes.
Found 30 images belonging to 6 classes.
[ ] print(x_train.class_indices)
{'0': 0, '1': 1, '2': 2, '3': 3, '4': 4, '5': 5}
Initializing The Model
[ ] model=Sequential()
25°C Partly cloudy
Search
ENG IN
23:13 18-11-2022


colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZlqHOweVf
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
Adding CNN Layers
[ ] model.add(Conv2D(32, (3, 3), input_shape=(64, 64, 1), activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Conv2D(32, (3, 3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))
+ Code + Text
[ ] model.add(Flatten())
Adding Dense Layers
[ ] model.add(Dense(units=512, activation='relu'))
[ ] model.add(Dense(units=6, activation='softmax'))
[ ] model.summary()
Model: "sequential_2"
25°C
Partly cloudy
Search
ENG
IN
23:13
18-11-2022


colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZlqHOweVf
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
Layer (type) Output Shape Param #
conv2d_4 (Conv2D) (None, 62, 62, 32) 320
max_pooling2d_4 (MaxPooling 2D) (None, 31, 31, 32) 0
conv2d_5 (Conv2D) (None, 29, 29, 32) 9248
max_pooling2d_5 (MaxPooling 2D) (None, 14, 14, 32) 0
flatten_2 (Flatten) (None, 6272) 0
dense_10 (Dense) (None, 512) 3211776
dense_11 (Dense) (None, 6) 3078
Total params: 3,224,422
Trainable params: 3,224,422
Non-trainable params: 0
Configure The Learning Process
25°C
Partly cloudy
Search
ENG
IN
23:13
18-11-2022


colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZIqHOweVf
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
Configure The Learning Process
[ ] model.compile(optimizer='adam', loss='categorical_crossentropy', metrics=['accuracy'])
Train The Model
model.fit_generator(x_train,steps_per_epoch= len(x_train),
epochs= 25,
validation_data=x_test,
validation_steps=len(x_train))
Epoch 1/25
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please u
after removing the cwd from sys.path.
10/10 [==============================] - 2s 108ms/step - loss: 0.0838 - accuracy: 0.9667 - val_loss: 4.8002 - val_accuracy: 0.3667
Epoch 2/25
10/10 [==============================] - 1s 88ms/step - loss: 0.0481 - accuracy: 1.0000 - val_loss: 3.2492 - val_accuracy: 0.5667
Epoch 3/25
10/10 [==============================] - 1s 90ms/step - loss: 0.1411 - accuracy: 0.9333 - val_loss: 2.1161 - val_accuracy: 0.6000
Epoch 4/25
10/10 [==============================] - 1s 102ms/step - loss: 0.0870 - accuracy: 0.9667 - val_loss: 3.3258 - val_accuracy: 0.3667
Epoch 5/25
10/10 [==============================] - 1s 86ms/step - loss: 0.0609 - accuracy: 0.9667 - val_loss: 4.7341 - val_accuracy: 0.3667
25°C
Partly cloudy
Search
ENG
IN
23:13
18-11-2022


colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZIqHOweVf
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment Share
+ Code + Text
Connect Editing
[ ] 10/10 [==============================] - 1s 86ms/step - loss: 0.0609 - accuracy: 0.9667 - val_loss: 4.7341 - val_accuracy: 0.3667
Epoch 6/25
10/10 [==============================] - 1s 102ms/step - loss: 0.0070 - accuracy: 1.0000 - val_loss: 2.9502 - val_accuracy: 0.5667
Epoch 7/25
10/10 [==============================] - 1s 87ms/step - loss: 0.0352 - accuracy: 0.9667 - val_loss: 2.4555 - val_accuracy: 0.6333
Epoch 8/25
10/10 [==============================] - 1s 92ms/step - loss: 0.0440 - accuracy: 0.9667 - val_loss: 3.2904 - val_accuracy: 0.5667
Epoch 9/25
10/10 [==============================] - 1s 106ms/step - loss: 0.0055 - accuracy: 1.0000 - val_loss: 2.6798 - val_accuracy: 0.6667
Epoch 10/25
10/10 [==============================] - 1s 88ms/step - loss: 0.0054 - accuracy: 1.0000 - val_loss: 4.6708 - val_accuracy: 0.4333
Epoch 11/25
10/10 [==============================] - 1s 86ms/step - loss: 0.0044 - accuracy: 1.0000 - val_loss: 4.1461 - val_accuracy: 0.5333
Epoch 12/25
10/10 [==============================] - 1s 91ms/step - loss: 0.0031 - accuracy: 1.0000 - val_loss: 5.3703 - val_accuracy: 0.5667
Epoch 13/25
10/10 [==============================] - 1s 107ms/step - loss: 0.0010 - accuracy: 1.0000 - val_loss: 3.1483 - val_accuracy: 0.6000
Epoch 14/25
10/10 [==============================] - 1s 92ms/step - loss: 0.0065 - accuracy: 1.0000 - val_loss: 3.0748 - val_accuracy: 0.5667
Epoch 15/25
10/10 [==============================] - 1s 106ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 4.2850 - val_accuracy: 0.7000
Epoch 16/25
10/10 [==============================] - 1s 105ms/step - loss: 6.9349e-04 - accuracy: 1.0000 - val_loss: 6.7626 - val_accuracy: 0.5333
Epoch 17/25
10/10 [==============================] - 1s 88ms/step - loss: 4.1833e-04 - accuracy: 1.0000 - val_loss: 4.0649 - val_accuracy: 0.4333
Epoch 18/25
10/10 [==============================] - 1s 89ms/step - loss: 2.2985e-04 - accuracy: 1.0000 - val_loss: 6.8380 - val_accuracy: 0.5000
25°C
Partly cloudy
Search
ENG
IN
23:14
18-11-2022


colab.research.google.com/drive/1zhkq1KTELJiZ6n5h7QN2pijZlqHOweVf
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
MODEL_TRAINING.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:12 PM
Comment
Share
+ Code + Text
Connect
Editing
[ ] 10/10 [==============================] - 1s 104ms/step - loss: 6.7672e-04 - accuracy: 1.0000 - val_loss: 5.0654 - val_accuracy: 0.5667
Epoch 20/25
10/10 [==============================] - 1s 89ms/step - loss: 8.1685e-04 - accuracy: 1.0000 - val_loss: 2.6641 - val_accuracy: 0.6667
Epoch 21/25
10/10 [==============================] - 1s 101ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 6.2709 - val_accuracy: 0.5333
Epoch 22/25
10/10 [==============================] - 1s 92ms/step - loss: 3.6468e-04 - accuracy: 1.0000 - val_loss: 6.2225 - val_accuracy: 0.5333
Epoch 23/25
10/10 [==============================] - 1s 87ms/step - loss: 2.6394e-04 - accuracy: 1.0000 - val_loss: 2.2229 - val_accuracy: 0.7333
Epoch 24/25
10/10 [==============================] - 1s 88ms/step - loss: 1.9120e-04 - accuracy: 1.0000 - val_loss: 7.6336 - val_accuracy: 0.5333
Epoch 25/25
10/10 [==============================] - 1s 88ms/step - loss: 1.4391e-04 - accuracy: 1.0000 - val_loss: 4.6080 - val_accuracy: 0.5000
<keras.callbacks.History at 0x7fb89db56d90>
Save The Model
[ ] model.save('gesture.h5')
[ ] model_json = model.to_json()
with open("model-bw.json", "w") as json_file:
json_file.write(model_json)
25°C
Partly cloudy
Search
ENG
IN
23:14
18-11-2022