Project Development Phase

Delivery of Sprint 2

Date	9 November 2022
Team ID	PNT2022TMID07640
Project Name	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation

Task 1:

Model Building:

Adding CNN Layers:

Code:

```
#ADDING CNN LAYERS
 model.add(Conv2D(32,(3,3),input_shape=(64,64,3),activation='relu'))#con
volution layer model.add(MaxPooling2D(pool_size=(2,2)))#MaxPooling2D for
downsampling the input
 model.add(Conv2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())#flatten the dimension of the image
```

Adding Dense Layers:

Code:

```
#ADDING DENSE LAYERS
 model.add(Dense(32))#deeply connected neural network layers.
model.add(Dense(6,activation='softmax'))
```

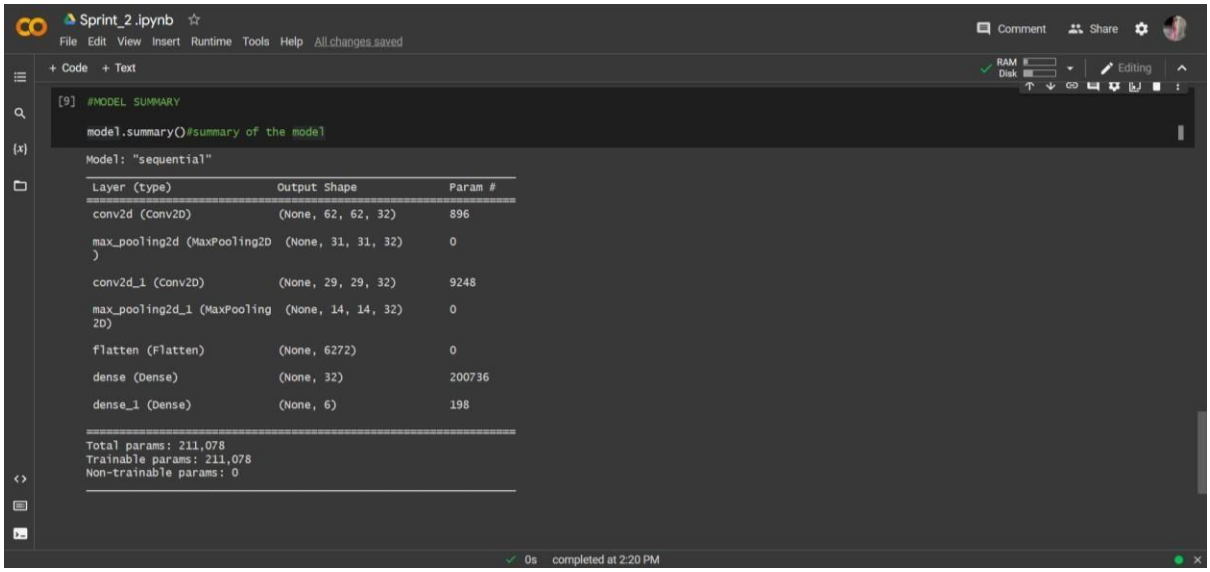
Model Summary:

Code:

```
#MODEL SUMMARY
```

```
model.summary()#summary of the model
```

Output:



Configure the Learning Process:

Code:

```
#CONFIGURE THE LEARNING PROCESS
 model.compile(optimizer='adam',loss='categorical_crossentropy',metrics=
['accuracy'])
```

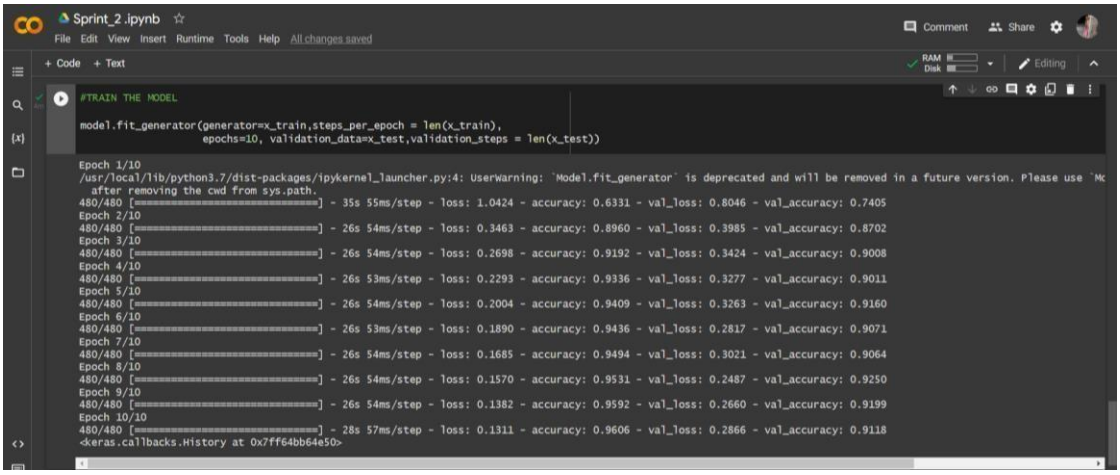
Train the Model:

Code:

```
#TRAIN THE MODEL

model.fit_generator(generator=x_train,steps_per_epoch = len(x_train),
epochs=10, validation_data=x_test,validation_steps = len(x_test))
```

Output:



Save the Model:

Code:

```
#SAVE THE
MODEL
model.save('ECG.h5')
```

Test the Model:

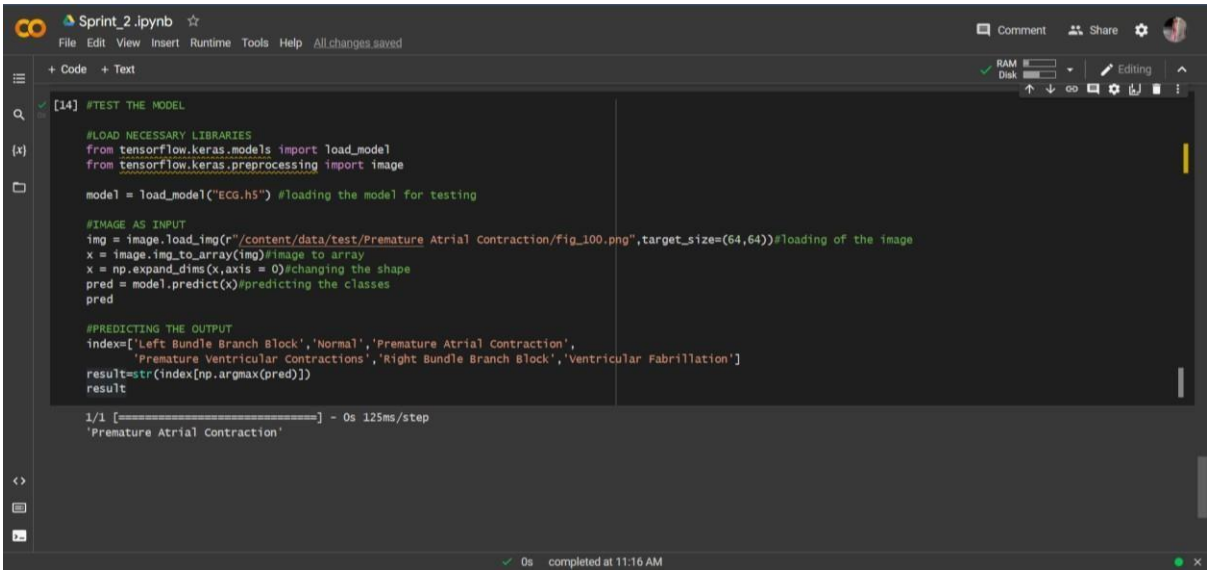
Code:

```
#TEST THE MODEL

#LOAD NECESSARY LIBRARIES from
tensorflow.keras.models import load_model from
tensorflow.keras.preprocessing import image
 model = load_model("ECG.h5") #loading the model for testing
#IMAGE AS INPUT img = image.load_img(r"/content/data/test/Premature
Atrial Contraction/ fig_100.png",target_size=(64,64))#loading of the image x =
image.img_to_array(img)#image to array x = np.expand_dims(x,axis =
0)#changing the shape pred = model.predict(x)#predicting the classes pred

#PREDICTING THE OUTPUT index=['Left Bundle Branch
Block','Normal','Premature Atrial Contractio n',
      'Premature Ventricular Contractions','Right Bundle Branch Block'
,'Ventricular Fabrillation']
result=str(index[np.argmax(pred)]) result
```

Output:


Sprint_2 .ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
RAM
Disk
Editing
[14] #TEST THE MODEL
#LOAD NECESSARY LIBRARIES
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
model = load_model("ECG.h5") #loading the model for testing
#IMAGE AS INPUT
img = image.load_img(r"/content/data/test/Premature Atrial Contraction/fig_100.png",target_size=(64,64))#loading of the image
x = image.img_to_array(img)#image to array
x = np.expand_dims(x,axis = 0)#changing the shape
pred = model.predict(x)#predicting the classes
pred
#PREDICTING THE OUTPUT
index=['Left Bundle Branch Block','Normal','Premature Atrial Contraction',
'Premature Ventricular Contractions','Right Bundle Branch Block','Ventricular Fabrillation']
result=str(index[np.argmax(pred)])
result
1/1 [==============================] - 0s 125ms/step
'Premature Atrial Contraction'
0s completed at 11:16 AM