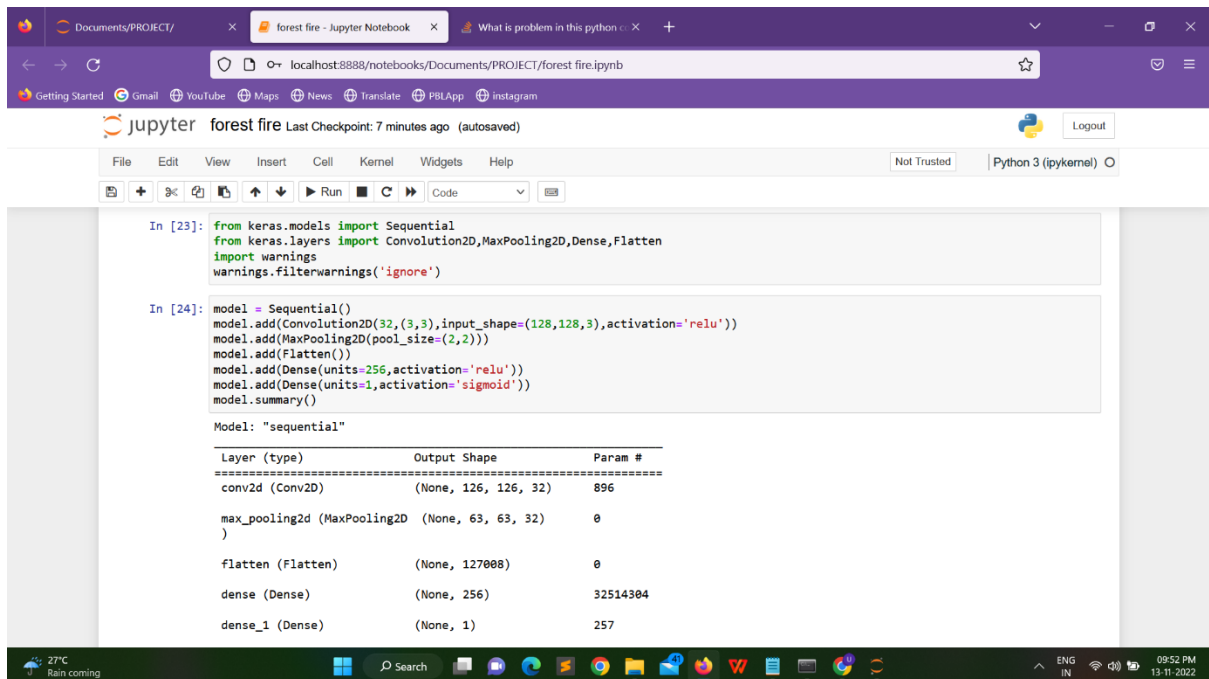


SPRINT – 2

MODEL BUILDING:

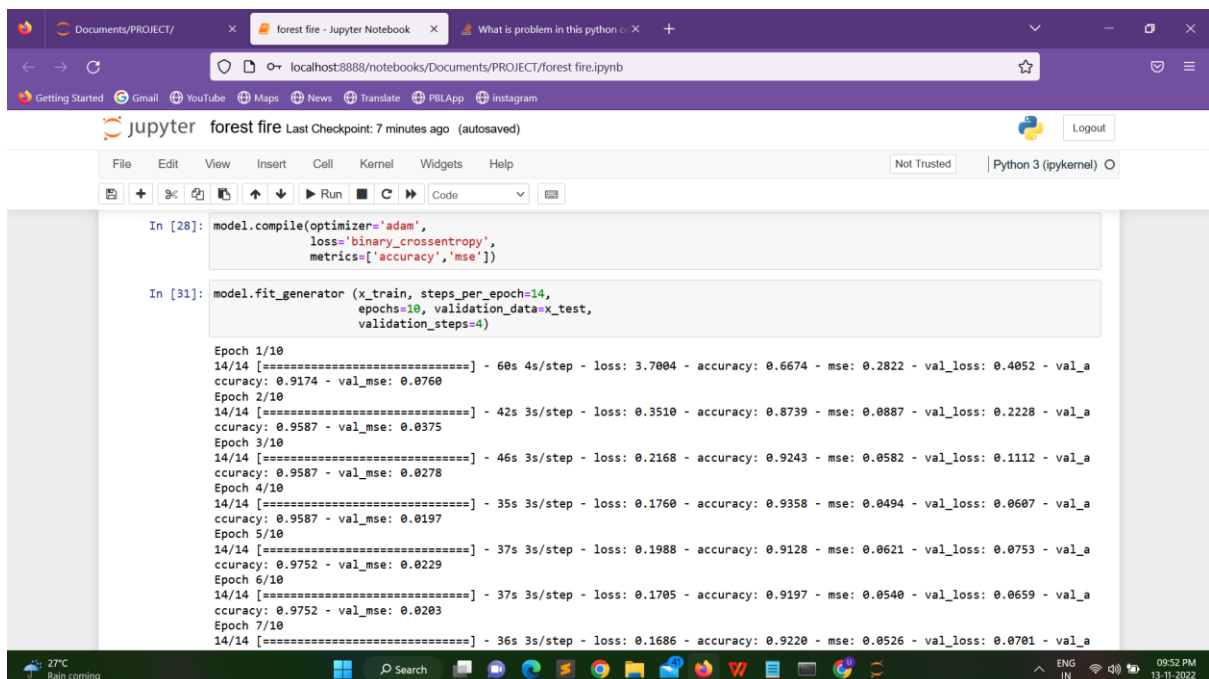


The screenshot shows a Jupyter Notebook titled 'forest fire' with two code cells. The first cell imports necessary Keras modules. The second cell defines a sequential model with three layers: a Convolution2D layer, a MaxPooling2D layer, and a Flatten layer, followed by two Dense layers. The model summary is displayed below the code.

```
In [23]: from keras.models import Sequential
from keras.layers import Convolution2D, MaxPooling2D, Dense, Flatten
import warnings
warnings.filterwarnings('ignore')

In [24]: model = Sequential()
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(units=256,activation='relu'))
model.add(Dense(units=1,activation='sigmoid'))
model.summary()

Model: "sequential"
Layer (type) Output Shape Param #
-----
conv2d (Conv2D) (None, 126, 126, 32) 896
max_pooling2d (MaxPooling2D) (None, 63, 63, 32) 0
flatten (Flatten) (None, 127008) 0
dense (Dense) (None, 256) 32514304
dense_1 (Dense) (None, 1) 257
```



The screenshot shows the continuation of the Jupyter Notebook. The third cell compiles the model with the Adam optimizer, binary crossentropy loss, and accuracy and MSE metrics. The fourth cell trains the model for 10 epochs. The output shows the progress of each epoch, including training and validation loss and accuracy.

```
In [28]: model.compile(optimizer='adam',
loss='binary_crossentropy',
metrics=['accuracy', 'mse'])

In [31]: model.fit_generator(x_train, steps_per_epoch=14,
epochs=10, validation_data=x_test,
validation_steps=4)

Epoch 1/10
14/14 [=====] - 60s 4s/step - loss: 3.7004 - accuracy: 0.6674 - mse: 0.2822 - val_loss: 0.4052 - val_a
ccuracy: 0.9174 - val_mse: 0.0760
Epoch 2/10
14/14 [=====] - 42s 3s/step - loss: 0.3510 - accuracy: 0.8739 - mse: 0.0887 - val_loss: 0.2228 - val_a
ccuracy: 0.9587 - val_mse: 0.0375
Epoch 3/10
14/14 [=====] - 46s 3s/step - loss: 0.2168 - accuracy: 0.9243 - mse: 0.0582 - val_loss: 0.1112 - val_a
ccuracy: 0.9587 - val_mse: 0.0278
Epoch 4/10
14/14 [=====] - 35s 3s/step - loss: 0.1760 - accuracy: 0.9358 - mse: 0.0494 - val_loss: 0.0607 - val_a
ccuracy: 0.9587 - val_mse: 0.0197
Epoch 5/10
14/14 [=====] - 37s 3s/step - loss: 0.1988 - accuracy: 0.9128 - mse: 0.0621 - val_loss: 0.0753 - val_a
ccuracy: 0.9752 - val_mse: 0.0229
Epoch 6/10
14/14 [=====] - 37s 3s/step - loss: 0.1705 - accuracy: 0.9197 - mse: 0.0540 - val_loss: 0.0659 - val_a
ccuracy: 0.9752 - val_mse: 0.0203
Epoch 7/10
14/14 [=====] - 36s 3s/step - loss: 0.1686 - accuracy: 0.9220 - mse: 0.0526 - val_loss: 0.0701 - val_a
```

Documents/PROJECT/ forest fire - Jupyter Notebook What is problem in this python

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```

ccuracy: 0.9752 - val_mse: 0.0214
Epoch 8/10
14/14 [=====] - 37s 3s/step - loss: 0.1564 - accuracy: 0.9381 - mse: 0.0493 - val_loss: 0.0773 - val_a
ccuracy: 0.9752 - val_mse: 0.0238
Epoch 9/10
14/14 [=====] - 47s 3s/step - loss: 0.1739 - accuracy: 0.9358 - mse: 0.0507 - val_loss: 0.0990 - val_a
ccuracy: 0.9752 - val_mse: 0.0273
Epoch 10/10
14/14 [=====] - 48s 3s/step - loss: 0.1718 - accuracy: 0.9266 - mse: 0.0523 - val_loss: 0.0545 - val_a
ccuracy: 0.9835 - val_mse: 0.0162

Out[31]: <keras.callbacks.History at 0x161007b09d0>

In [32]: model.save("forest1.h5")

In [81]: #import load_model from keras.model
import matplotlib.pyplot as plt
from keras.models import load_model
#import image class from keras
from keras.preprocessing import image
#import numpy
import numpy as np
from PIL import Image
#import cv2
import cv2
from PIL import Image
from keras.utils import img_to_array

```

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```

In [82]: model = load_model("forest1.h5")

In [83]: def prediction(img_path):
l = cv2.imread(img_path)
l = cv2.cvtColor(l, cv2.COLOR_BGR2RGB)
img = image.open(img_path)
img = img.resize((128,128))
x = img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = model.predict(x)
plt.imshow(l)
print("%s"%("FOREST FIRE DETECTED!" if pred==[[1.]] else "NO FOREST FIRE DETECTED!"))

In [84]: prediction(r"C:\Users\Akash\Downloads\Dataset\test_set\forest\beech_oak_forest_360.jpg")

1/1 [=====] - 0s 218ms/step
NO FOREST FIRE DETECTED

0
50
100
150
200
250
300
350
0 100 200 300 400 500

In [85]: prediction(r"C:\Users\Akash\Downloads\Dataset\test_set\forest\europesloft.jpg")

1/1 [=====] - 0s 112ms/step
NO FOREST FIRE DETECTED

```

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```
In [87]: prediction(r"C:\Users\Akash\Downloads\Dataset\Dataset\test_set\with fire\in_forestfires_shutter.jpg")
1/1 [-----] - 0s 112ms/step
FOREST FIRE DETECTED! SMS SENT!
```



In [88]: prediction(r"C:\Users\Akash\Downloads\Dataset\Dataset\test_set\with fire\unmarkeddefault.jpg")
1/1 [-----] - 0s 112ms/step
FOREST FIRE DETECTED! SMS SENT!



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