# Deep Learning Techniques for Breast Cancer Risk Prediction using IBM Cloud

## 1. INTRODUCTION

### 1.1 Overview

Breast cancer is a dominant cancer in women worldwide and is increasing in developing countries where the majority of cases are diagnosed in late stages. The projects that have already been proposed show a comparison of machine learning algorithms with the help of different techniques like the ensemble methods, data mining algorithms or using blood analysis etc. This paper proposed now presents a comparison of six machine learning (ML) algorithms: Naive Bayes (NB), Random Forest (RT), Artificial Neural Networks (ANN), Nearest Neighbour (KNN), Support Vector Machine (SVM) and Decision Tree (DT) on the Wisconsin Diagnostic Breast Cancer (WDBC) dataset which is extracted from a digitised image of an MRI. For the implementation of the ML algorithms, the dataset was partitioned into the training phase and the testing phase. The algorithm with the best results will be used as the backend to the website and the will then classify the cancer as benign or malignant.

### 1.2 Purpose

Machince learning is one of the most popular models to easily train machines and create predictive models for successful decision-making. Machine learning helps with early diagnosis of breast cancer and determines the nature of the cancer by analysing the tumour size. ML methods are the leading approaches to obtain favourable outcomes among classification and prediction problems. Breast cancer research could benefit from ML techniques used to identify cancer and predict the presence or absence of tumours.

## 2. LITERATURE SURVEY

The role various modalities in breast imaging by Sachin Prasad N and Dana Houserkova, 2007. Mammography is the only reliable screening test proven in breast imaging.

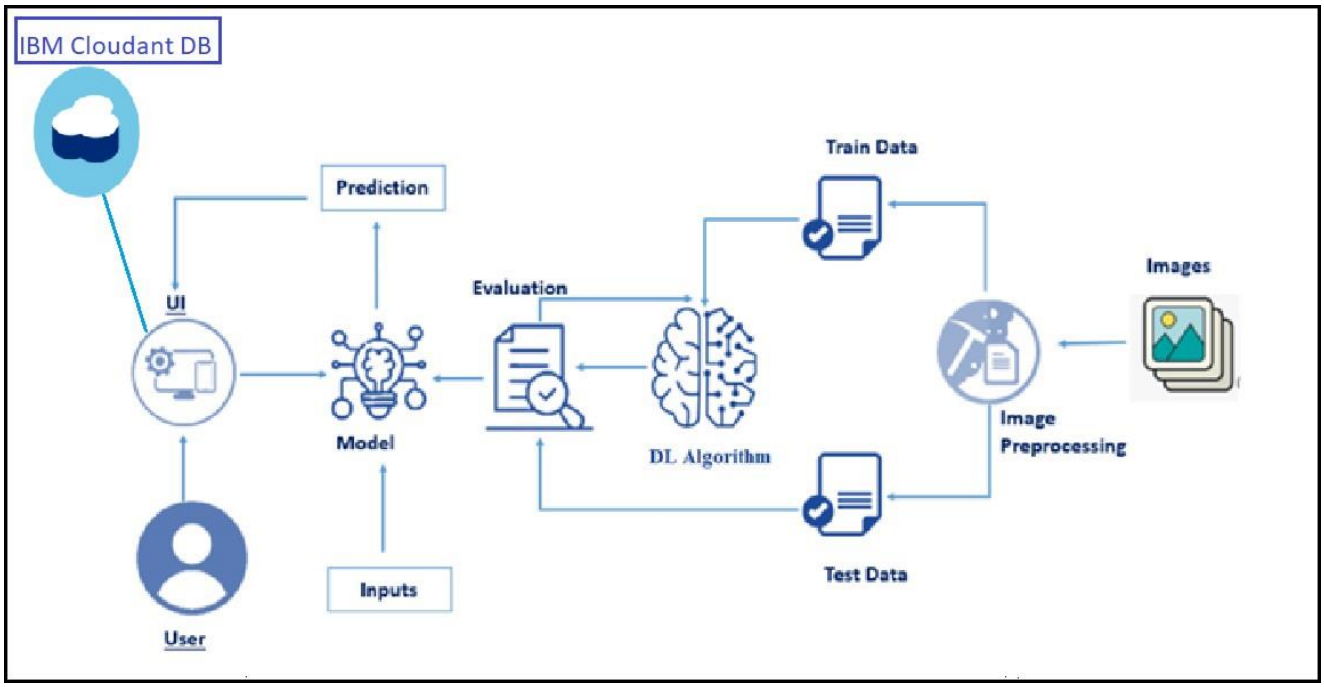
Identification of Preprocessing Technique for Enhancement of Mammogram Images by Jaya Sherma, R P Tewari and J K Rai, 2014.

Determining best preprocessing technique on the basis of peak signal to noise ratio for set of mammogram images.

Classification of Mammogram Images by using CNN Classifier by Ketan Sharma and Bobbin Preet, 2016. In this paper they proposed a computer aided diagnosis(CAD) system named as CNN. . They had also compared of CNN with Logistic Regression algorithm.

# 3. THEORITICAL ANALYSIS

## 3.1 Block Diagram




## 3.2 Hardware / Software designing

### *Software Requirements:*

- Anaconda Navigator
- Tensor flow
- Keras
- Flask

### *Hardware Requirements:*

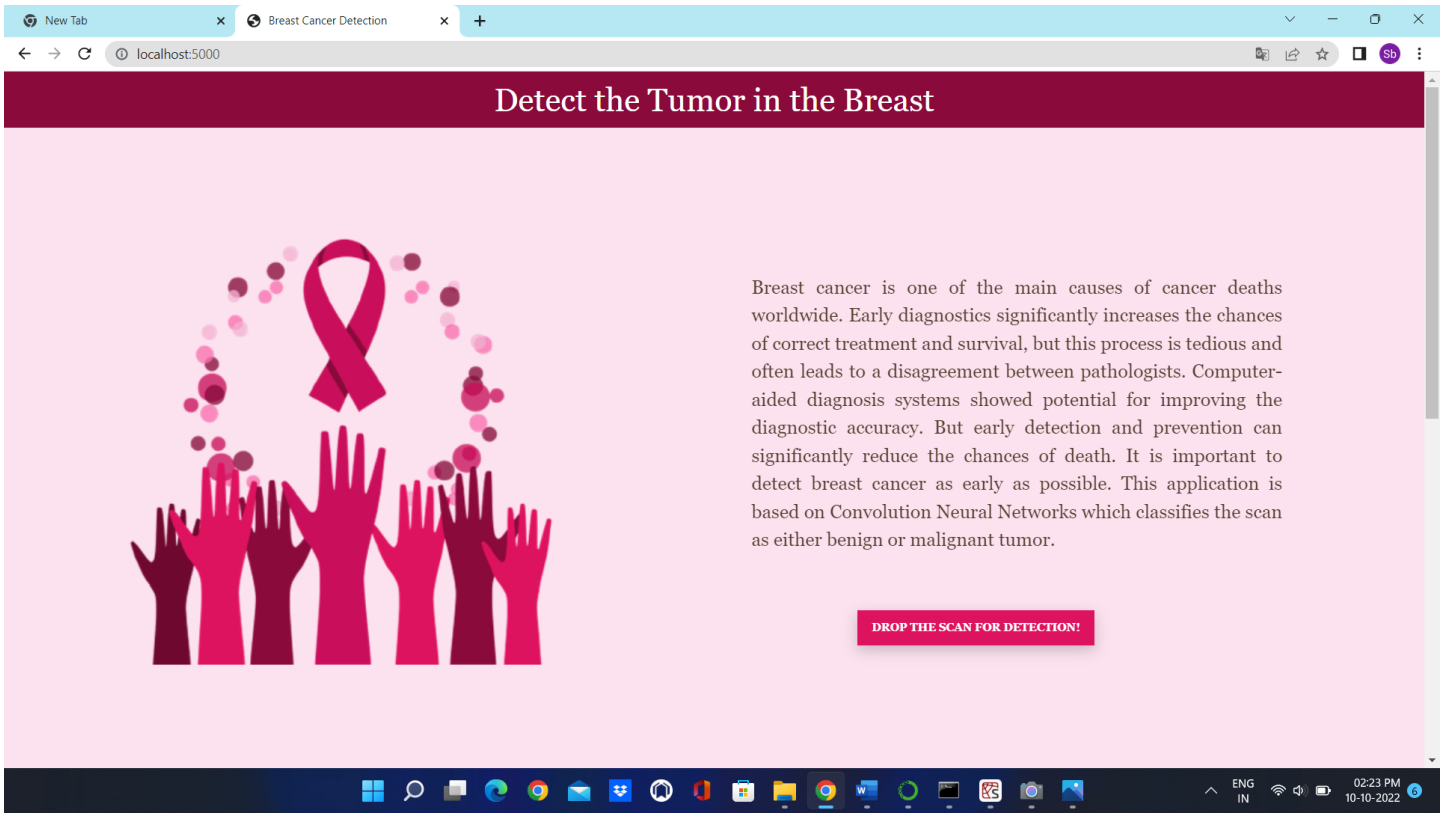
- Processor : Intel Core i3
- Hard Disk Space : Min 100 GB
- Ram : 4 GB
- Display : 14.1 “Color Monitor(LCD, CRT or LED)

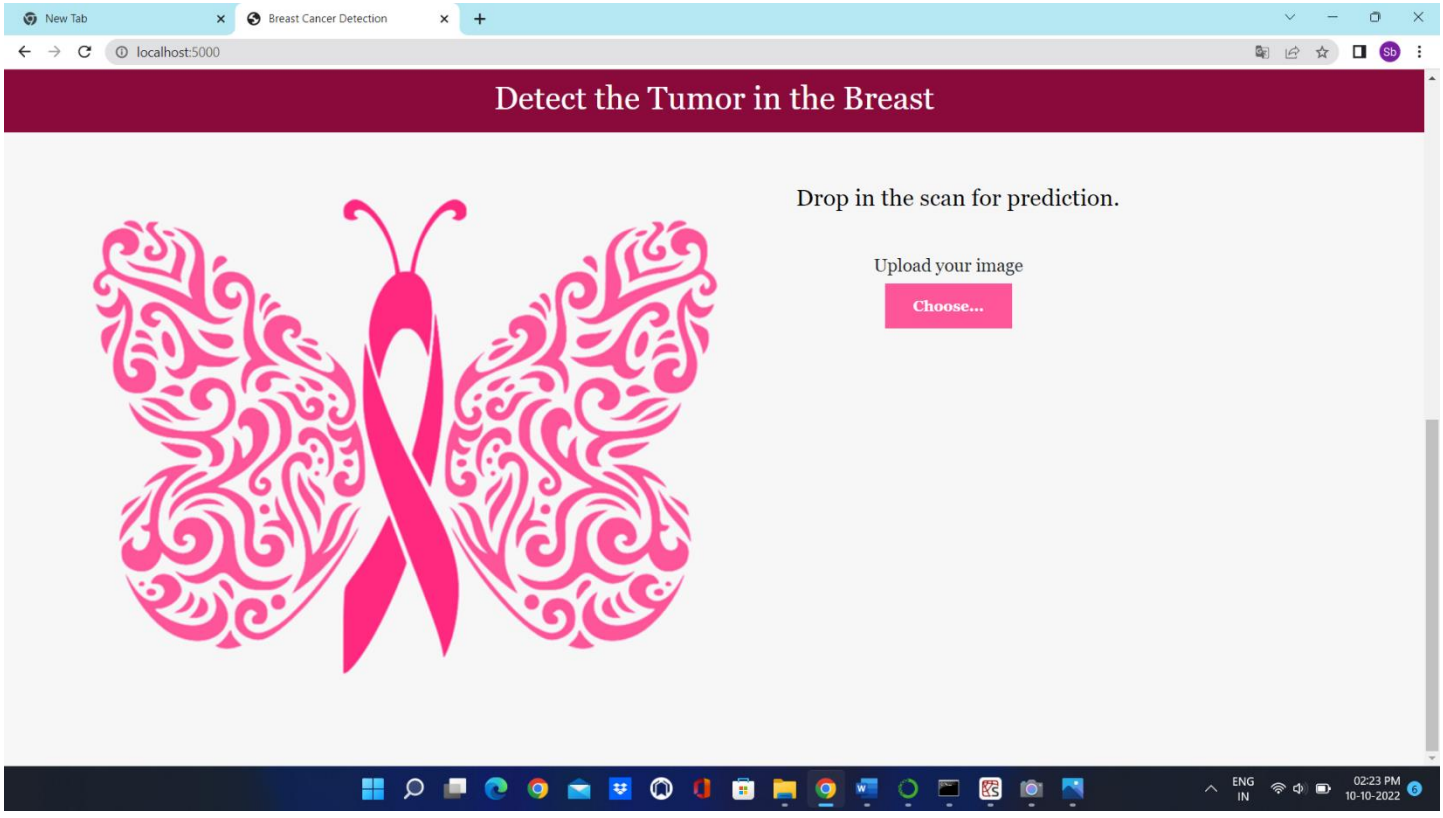
  Clock Speed : 1.67 GHz

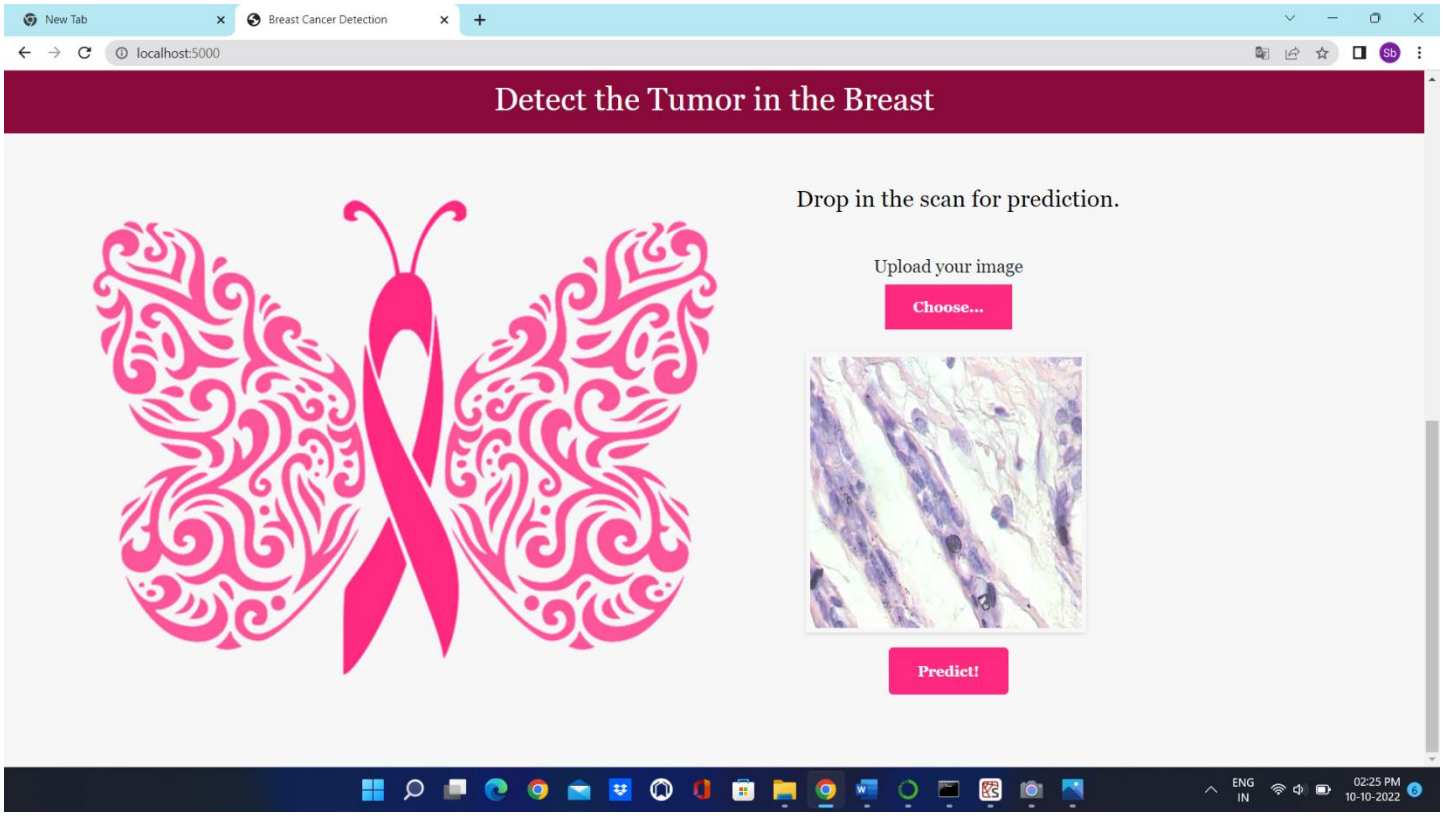
## 4. EXPERIMENTAL INVESTIGATIONS

Study shows that it provide with different test images of breast cancer images, the model detects, cost prediction of uploaded image. When we choose an image and click in to the upload it then it will shows the predicted output.

## 5. RESULT


New Tab
Breast Cancer Detection
localhost:5000
Detect the Tumor in the Breast
Breast cancer is one of the main causes of cancer deaths worldwide. Early diagnostics significantly increases the chances of correct treatment and survival, but this process is tedious and often leads to a disagreement between pathologists. Computer-aided diagnosis systems showed potential for improving the diagnostic accuracy. But early detection and prevention can significantly reduce the chances of death. It is important to detect breast cancer as early as possible. This application is based on Convolution Neural Networks which classifies the scan as either benign or malignant tumor.
DROP THE SCAN FOR DETECTION!
ENG
IN
02:23 PM
10-10-2022


New Tab
Breast Cancer Detection
localhost:5000
Detect the Tumor in the Breast
Drop in the scan for prediction.
Upload your image
Choose...
ENG
IN
02:23 PM
10-10-2022




# 6. ADVANTAGES & DISADVANTAGES

***Advantages:***

- Increased accuracy for insurance prediction.
- Reduce the time complexity.

***Disadvantages:***

- Data mining techniques does not help to provide effective decision making.

## 7. APPLICATIONS

- Deep Learning technology is considered as one of the key technology used in breast cancer detection.
- It presents the results obtained by processing input from uploading image.

## 8. CONCLUSION

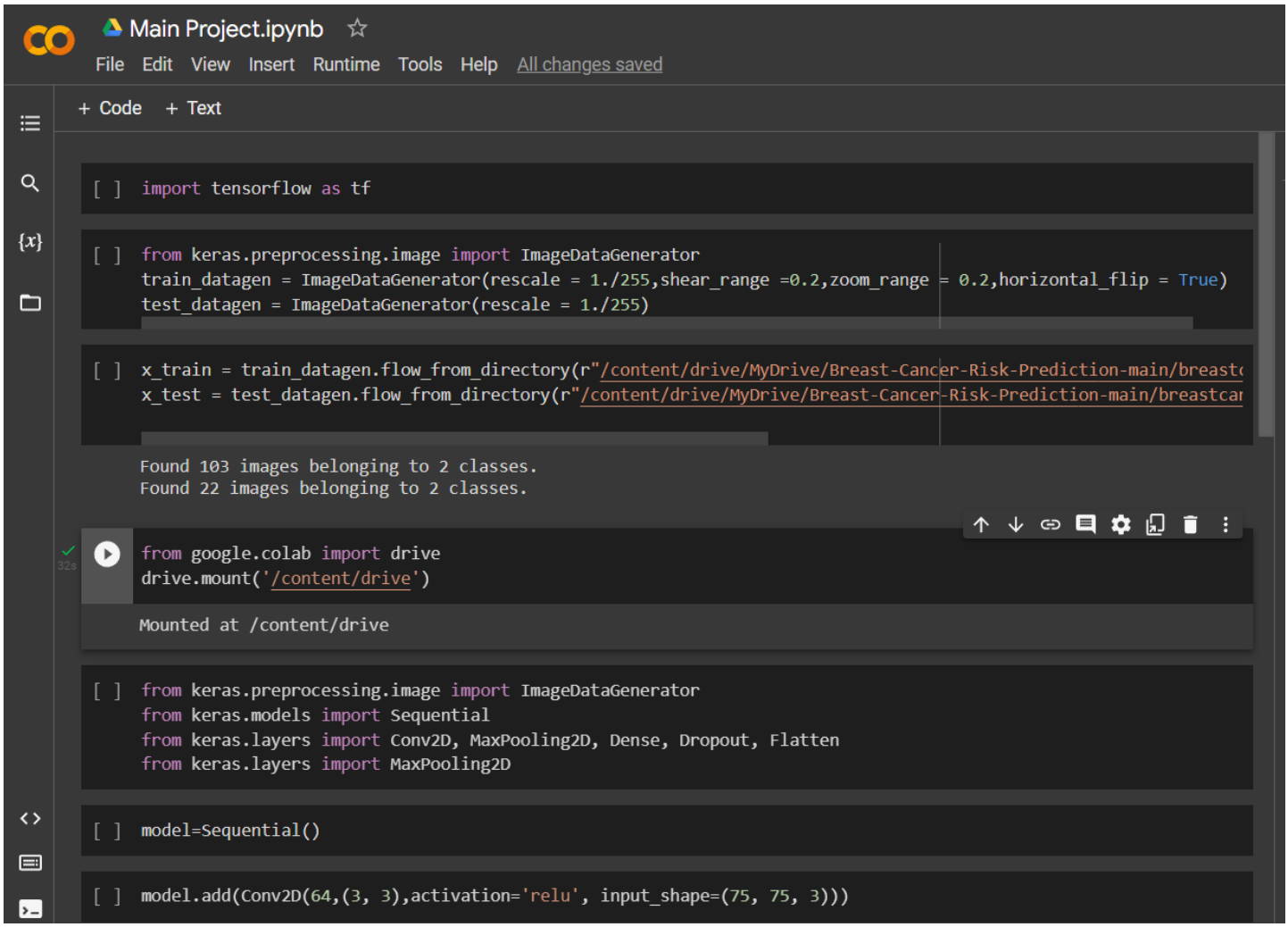
In this project, we have established the application to predict from uploaded image based on the IBM cloud application. Breast cancer prediction can only use this web app to predict the cancer.

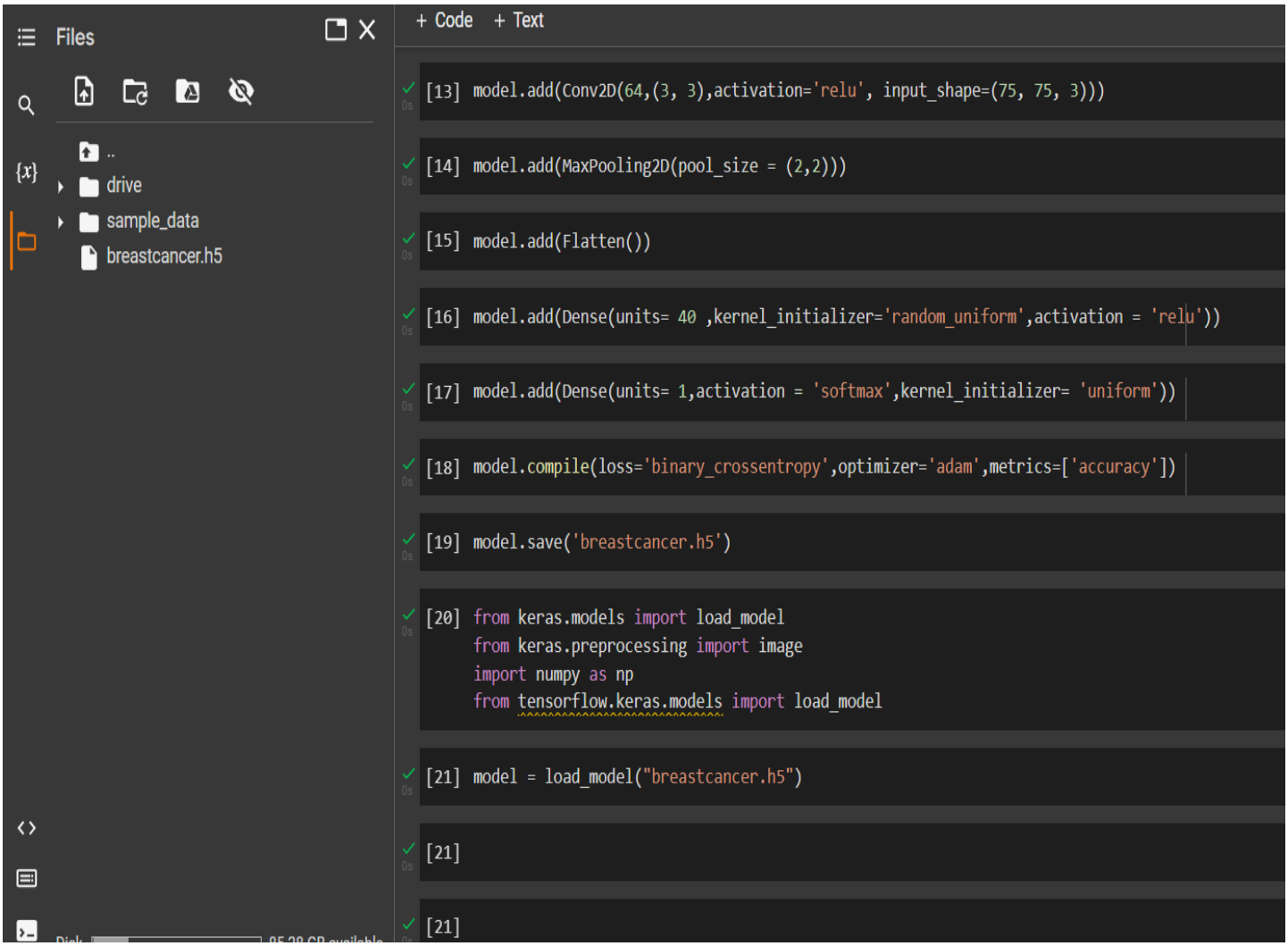
## 9. FUTURE SCOPE

The analysis of the results signifies that the integration of multidimensional data along with different classification, feature selection and dimensionality reduction techniques can provide auspicious tools for inference in this domain. Further research in this field should be carried out for the better performance of the classification techniques so that it can predict on more variables. We are intending how to parametrize our classification techniques hence to achieve high accuracy. We are looking into many datasets and how further Machine Learning algorithms can be used to characterize Breast Cancer. We want to reduce the error rates with maximum accuracy

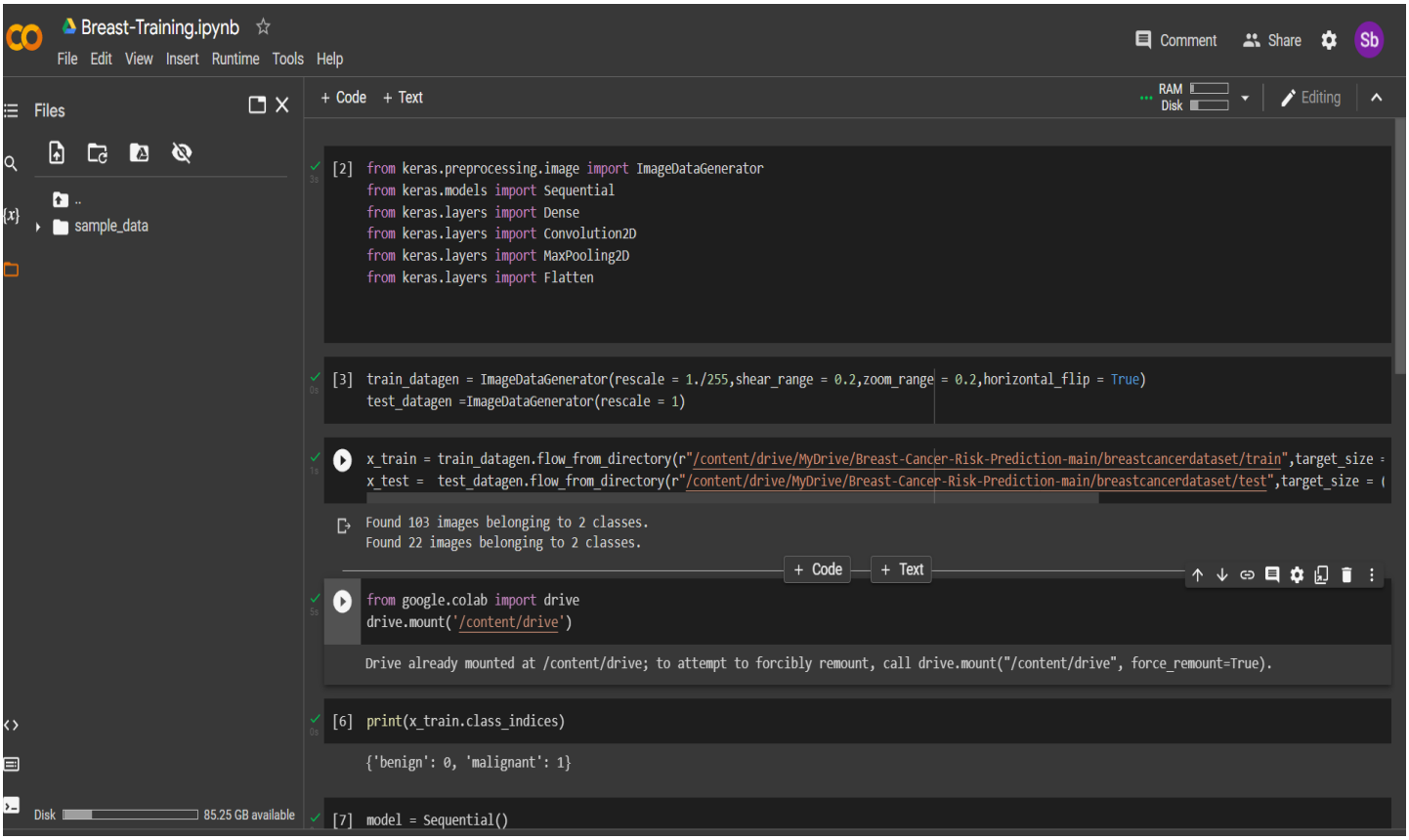
# APPENDIX

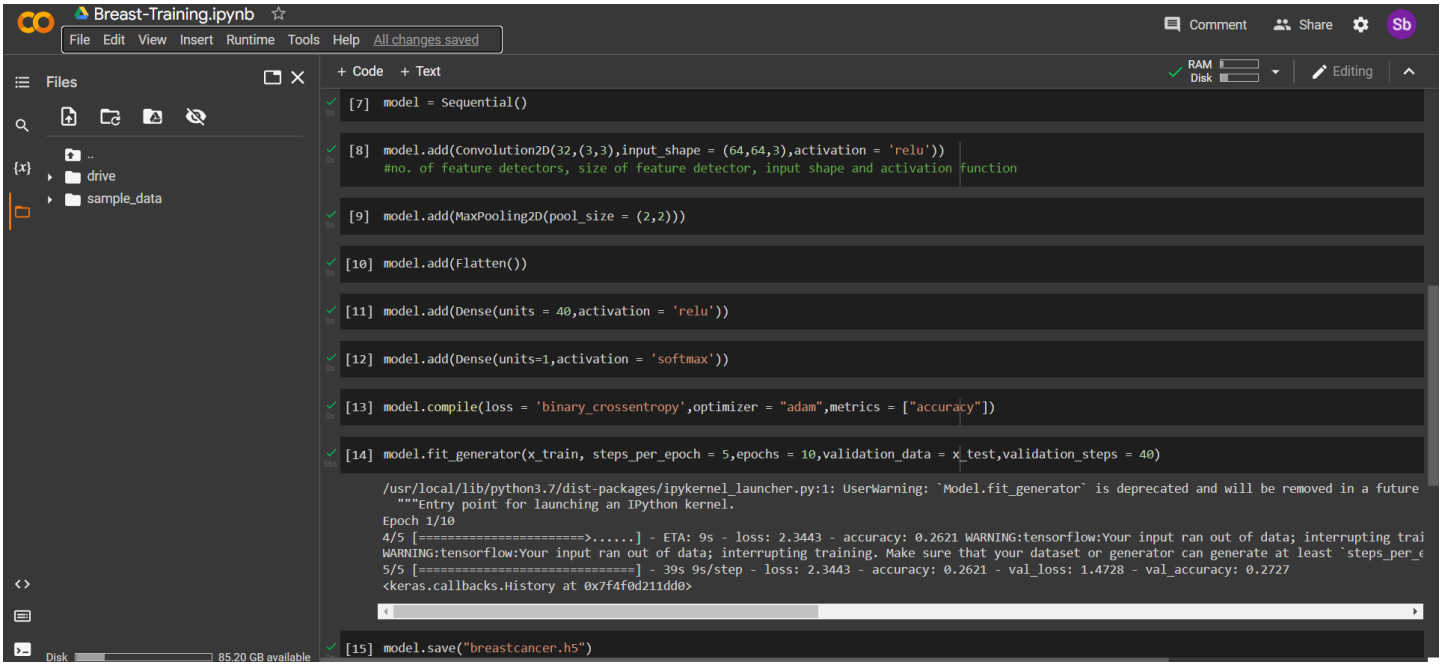
## Source Code



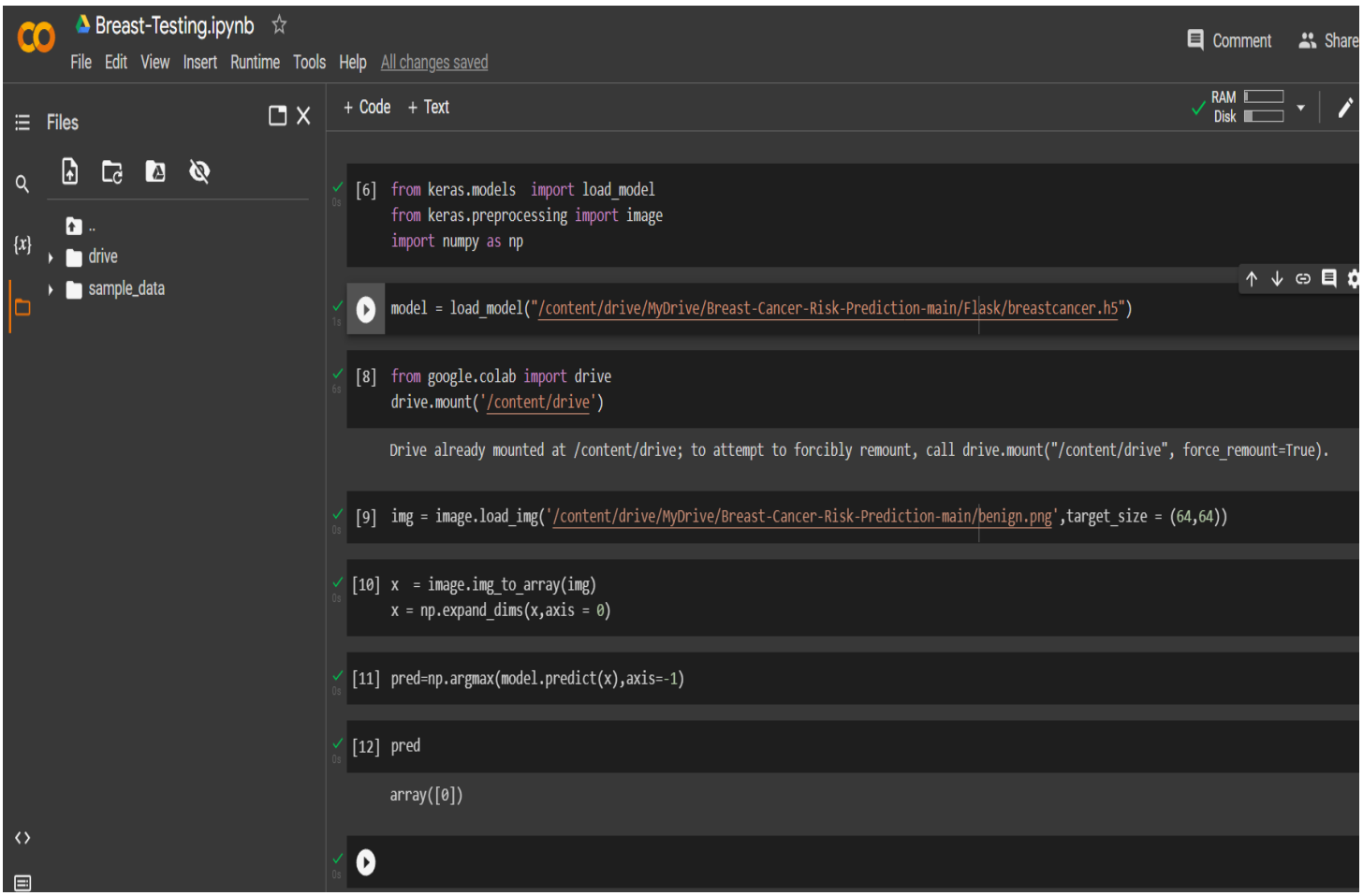

Files
..
drive
sample_data
breastcancer.h5
+ Code
+ Text
[13] model.add(Conv2D(64,(3, 3),activation='relu', input_shape=(75, 75, 3)))
[14] model.add(MaxPooling2D(pool_size = (2,2)))
[15] model.add(Flatten())
[16] model.add(Dense(units= 40 ,kernel_initializer='random_uniform',activation = 'relu'))
[17] model.add(Dense(units= 1,activation = 'softmax',kernel_initializer= 'uniform'))
[18] model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
[19] model.save('breastcancer.h5')
[20] from keras.models import load_model
from keras.preprocessing import image
import numpy as np
from tensorflow.keras.models import load_model
[21] model = load_model("breastcancer.h5")
[21]
[21]

# Training Model:

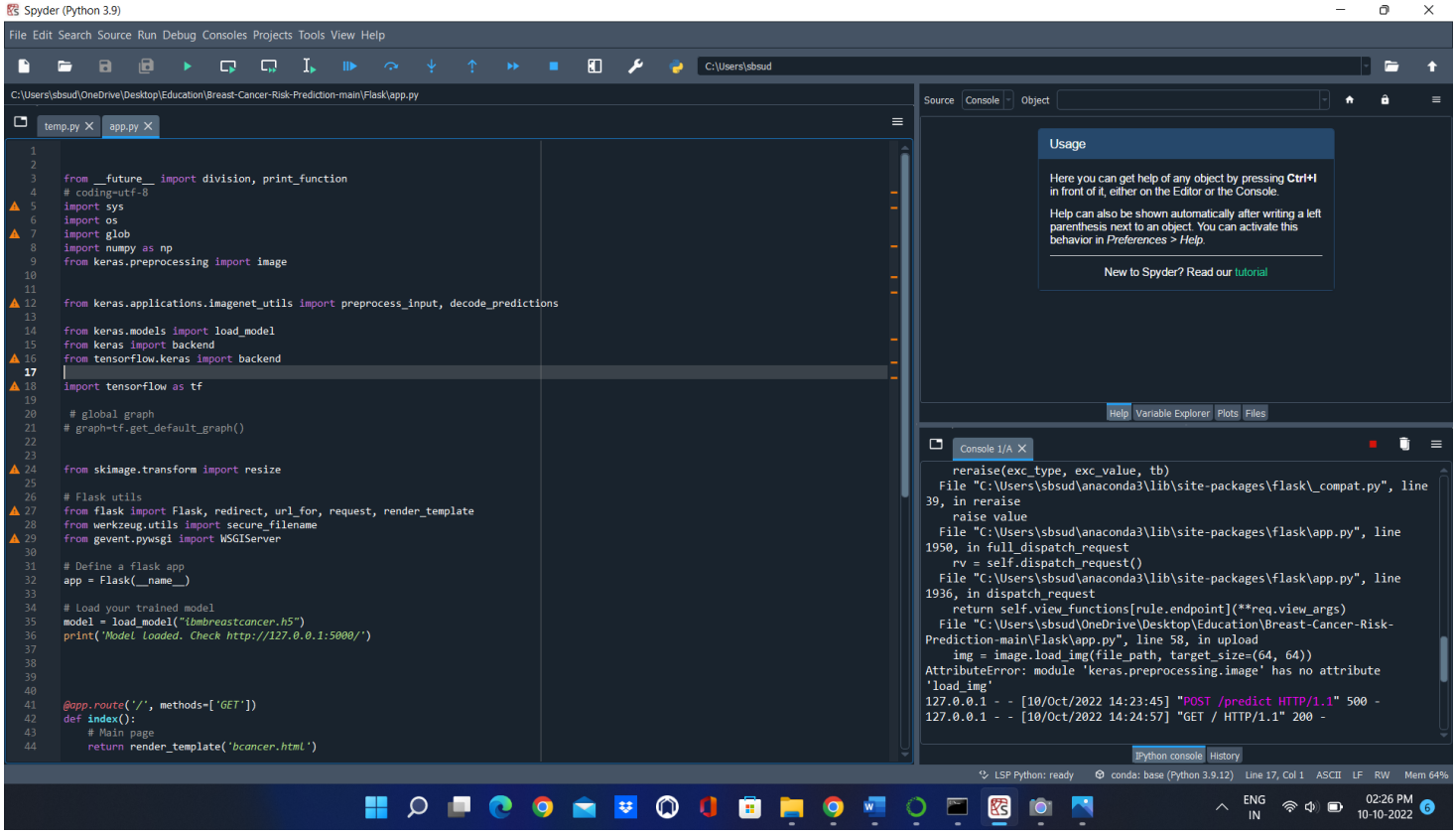


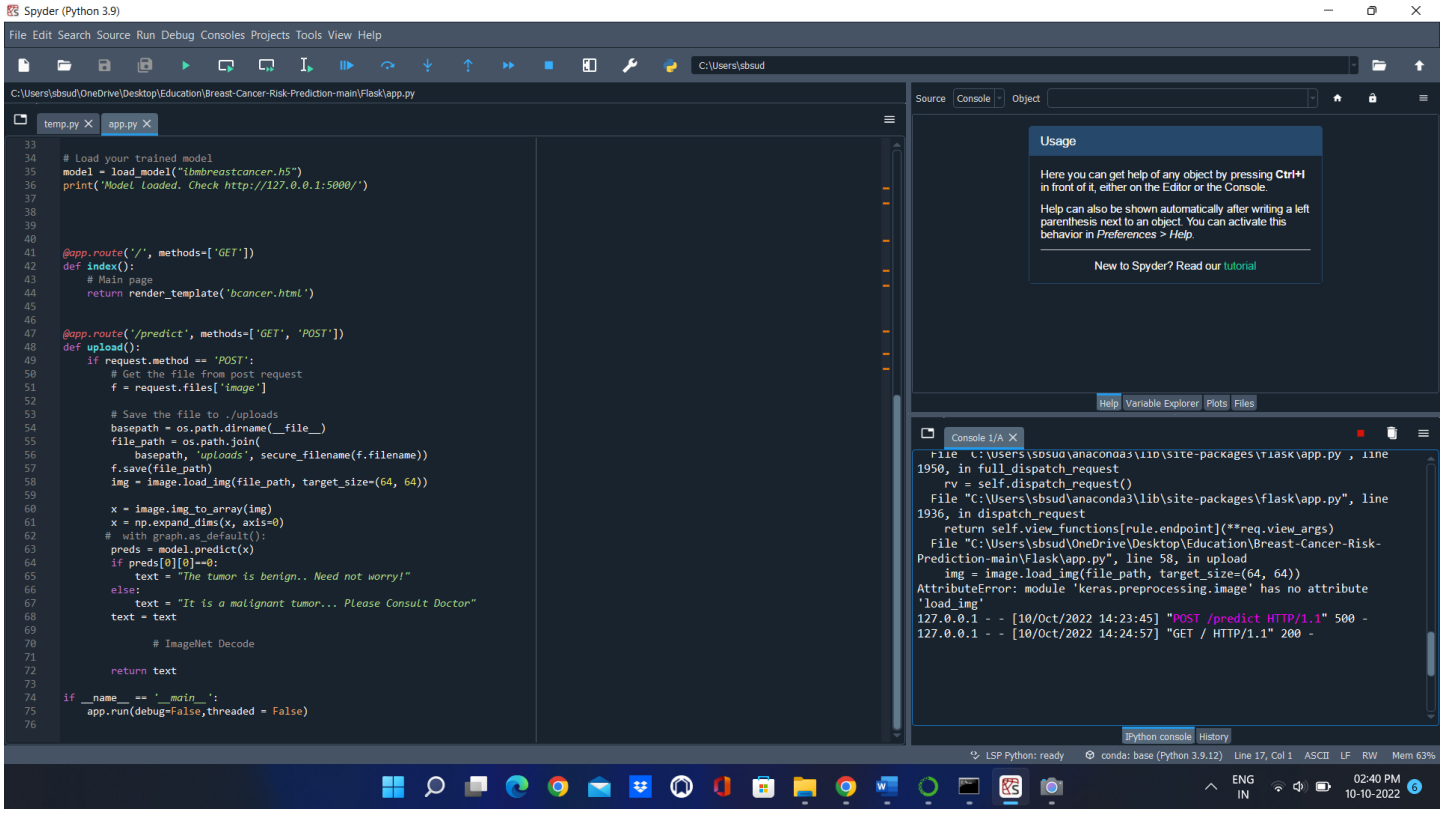



# Testing Model:

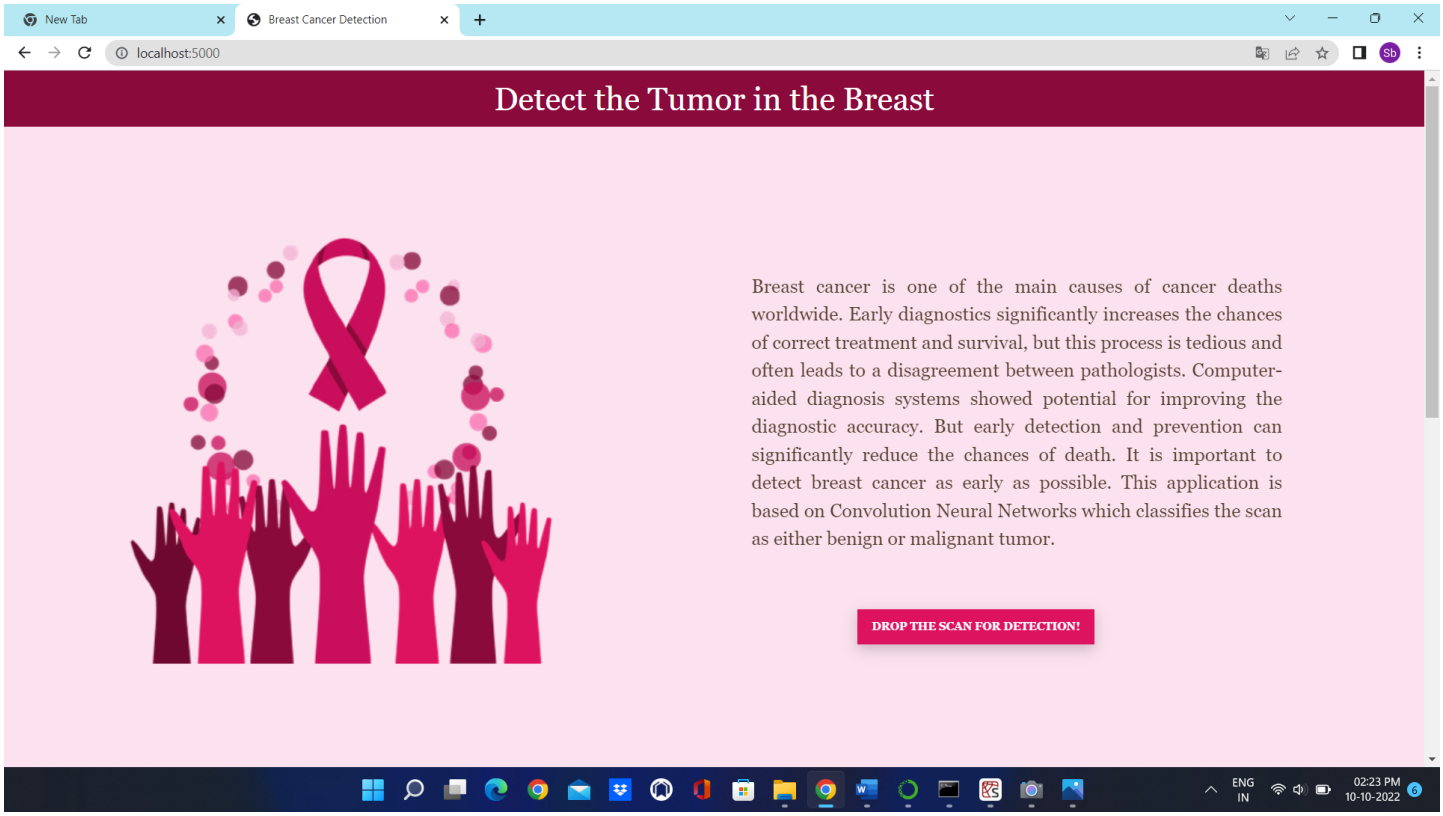


# Interface: App




Spyder (Python 3.9)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\sbsud\OneDrive\Desktop\Education\Breast-Cancer-Risk-Prediction-main\Flask\app.py
temp.py
app.py
# Load your trained model
model = load_model("ibmbreastcancer.h5")
print('Model loaded. Check http://127.0.0.1:5000/')
@app.route('/', methods=['GET'])
def index():
# Main page
return render_template('bcancer.html')
@app.route('/predict', methods=['GET', 'POST'])
def upload():
if request.method == 'POST':
# Get the file from post request
f = request.files['image']
# Save the file to ./uploads
basepath = os.path.dirname(__file__)
file_path = os.path.join(
basepath, 'uploads', secure_filename(f.filename))
f.save(file_path)
img = image.load_img(file_path, target_size=(64, 64))
x = image.img_to_array(img)
x = np.expand_dims(x, axis=0)
# with graph.as_default():
preds = model.predict(x)
if preds[0][0]==0:
text = "The tumor is benign.. Need not worry!"
else:
text = "It is a malignant tumor... Please Consult Doctor"
text = text
# ImageNet Decode
return text
if __name__ == '__main__':
app.run(debug=False,threaded = False)
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Help Variable Explorer Plots Files
Console 1/A
1950, in full_dispatch_request
rv = self.dispatch_request()
File "C:\Users\sbsud\anaconda3\lib\site-packages\flask\app.py", line 1936, in dispatch_request
return self.view_functions[rule.endpoint](**req.view_args)
File "C:\Users\sbsud\OneDrive\Desktop\Education\Breast-Cancer-Risk-Prediction-main\Flask\app.py", line 58, in upload
img = image.load_img(file_path, target_size=(64, 64))
AttributeError: module 'keras.preprocessing.image' has no attribute 'load_img'
127.0.0.1 - - [10/Oct/2022 14:23:45] "POST /predict HTTP/1.1" 500 -
127.0.0.1 - - [10/Oct/2022 14:24:57] "GET / HTTP/1.1" 200 -
IPython console History
LSP Python: ready
conda: base (Python 3.9.12)
Line 17, Col 1
ASCII
LF
RW
Mem 63%
ENG
IN
02:40 PM
10-10-2022

# Output: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