Deep Learning Techniques for Breast Cancer Risk Prediction using IBM Cloud

1.INTRODUCTION

1.1 Overview

Breast cancer is one of the main causes of cancer death worldwide. Computer-aided diagnosis systems showed the potential for improving 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.

1.2 Purpose

The goal is to classify images into two classifications of malignant and benign. As early diagnostics significantly increases the chances of correct treatment and survival. In this application, we are helping the doctors and patients to classify the Type of Tumour for the specific image given with the help of Neural Networks.

2. LITERATURE SURVEY

2.1 Existing problem

One of the main causes of cancer death worldwide is Breast Cancer. Computer-aided diagnosis systems showed the potential for improving 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.

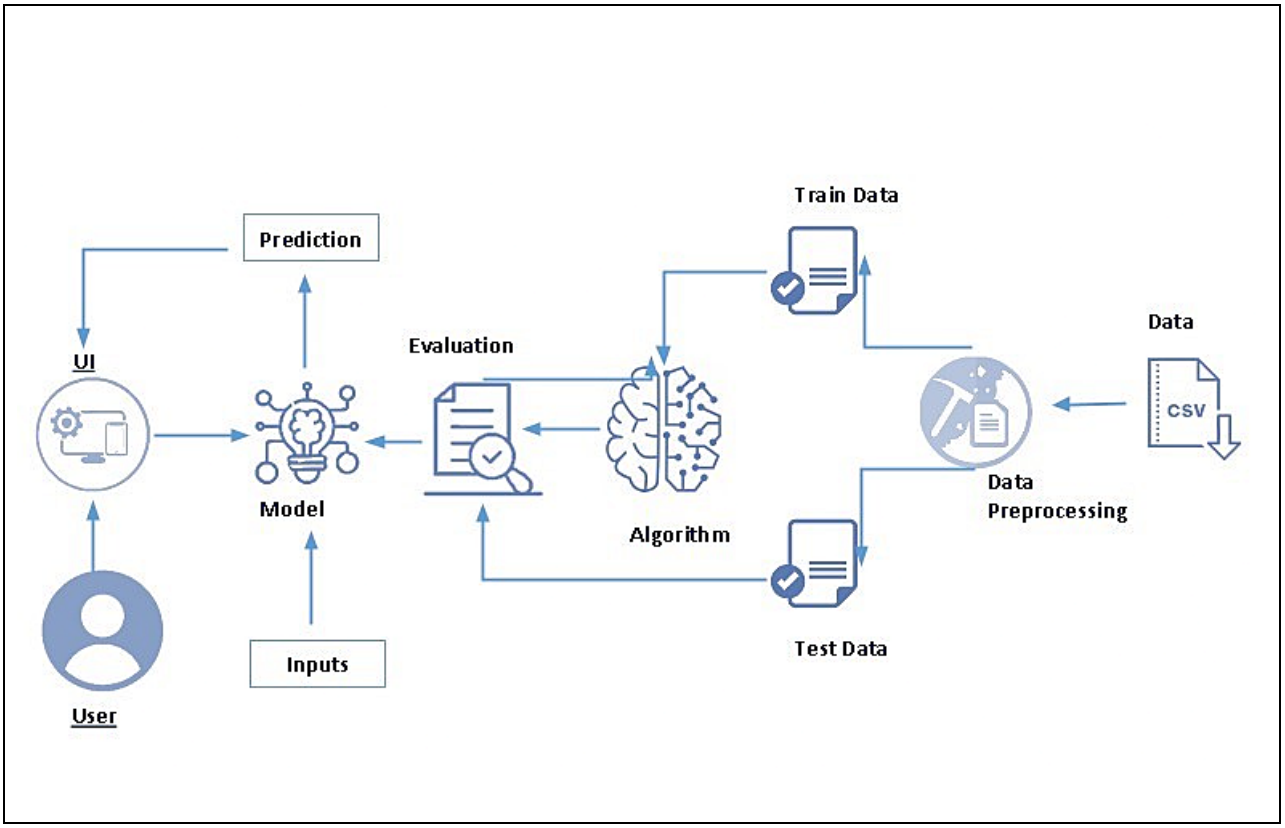
2.2 Proposed Solution

This project goal is to classify images into two classifications of malignant and benign. As early diagnostics significantly increases the chances of correct treatment and

survival. In this application, we are helping the doctors and patients to classify the Type of Tumour for the specific image given with the help of Neural Networks.

3. THEORITICAL ANALYSIS

3.1 Block Diagram



3.2 Hardware / Software designing

Software Requirements:

- Ananconda Navigator
- Tensor flow
- Keras
- Flask

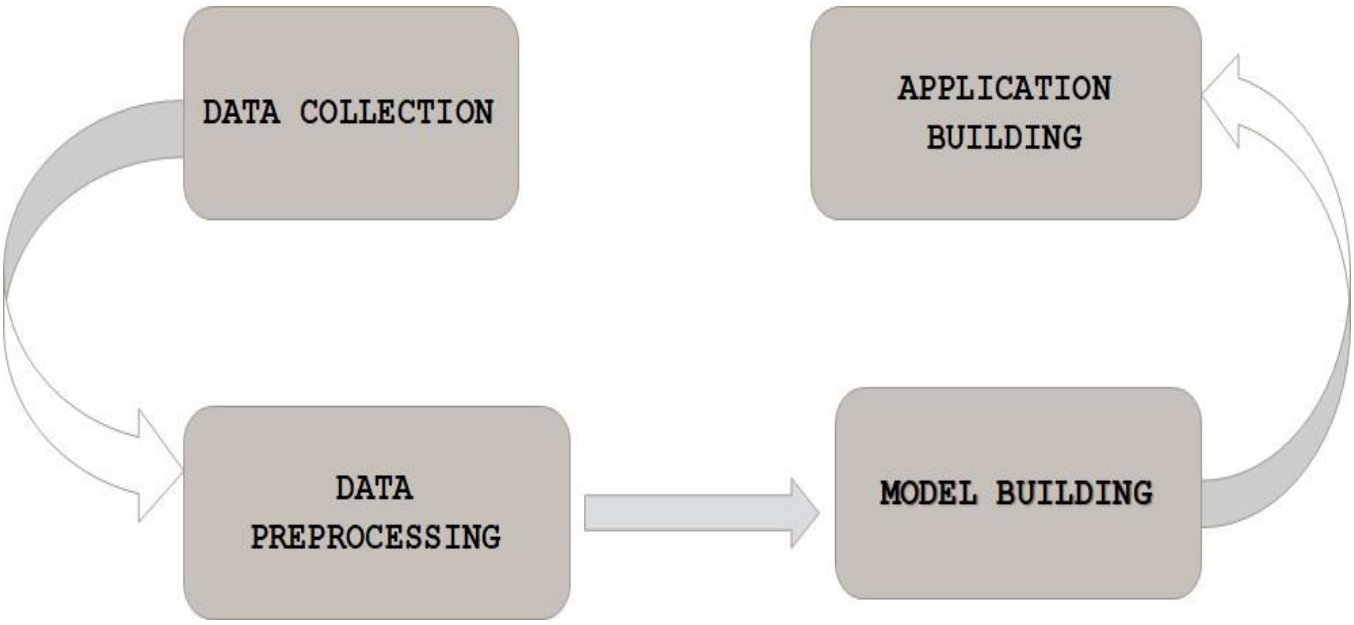
Hardware Requirements:

- Processor : Intel Core i3
- Hard Disk Space : Min 100GB
- Ram : 4GB
- Display : 14.1 “Color Monitor(LCD, CRT or LED)
- Clock Speed : 1.67 GHz

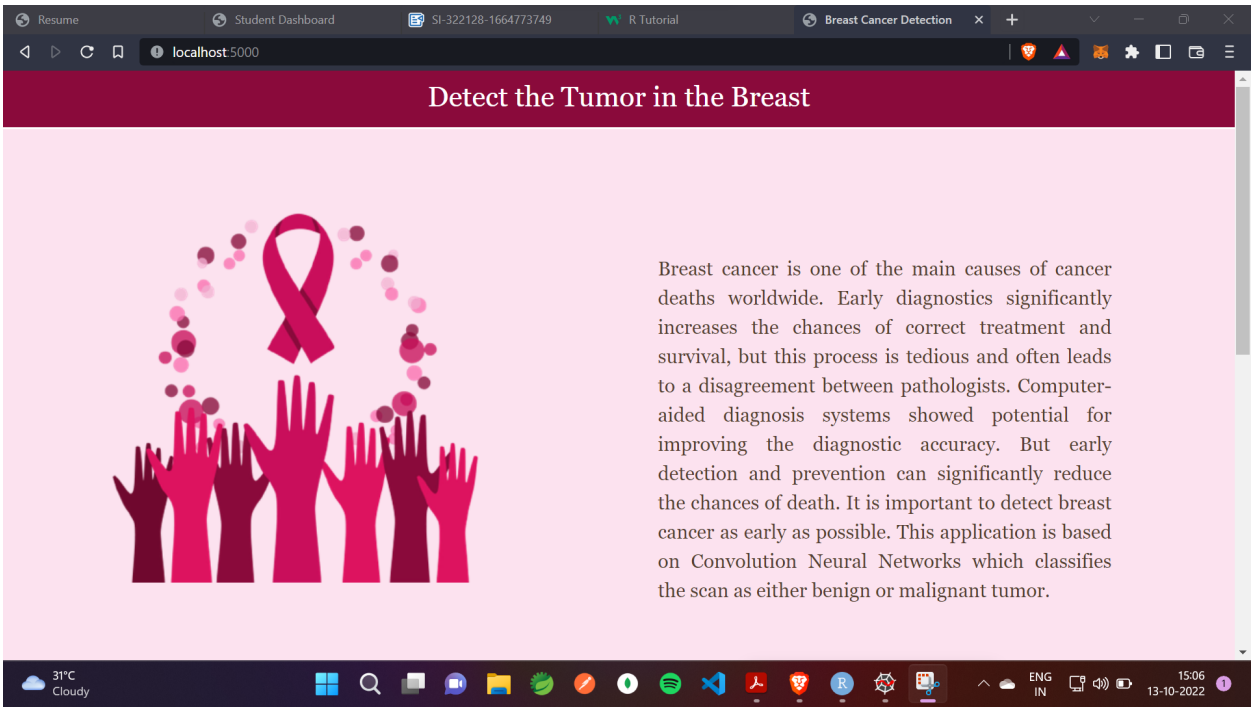
4. EXPERIMENTAL INVESTIGATIONS

It shows that a model provided with different breast cancer scanning report images will predict the tumor and dispalys the output. Choose the image and click on upload, then it will predict the output.

5. FLOWCHART



6. RESULT


Resume
Student Dashboard
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R Tutorial
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.
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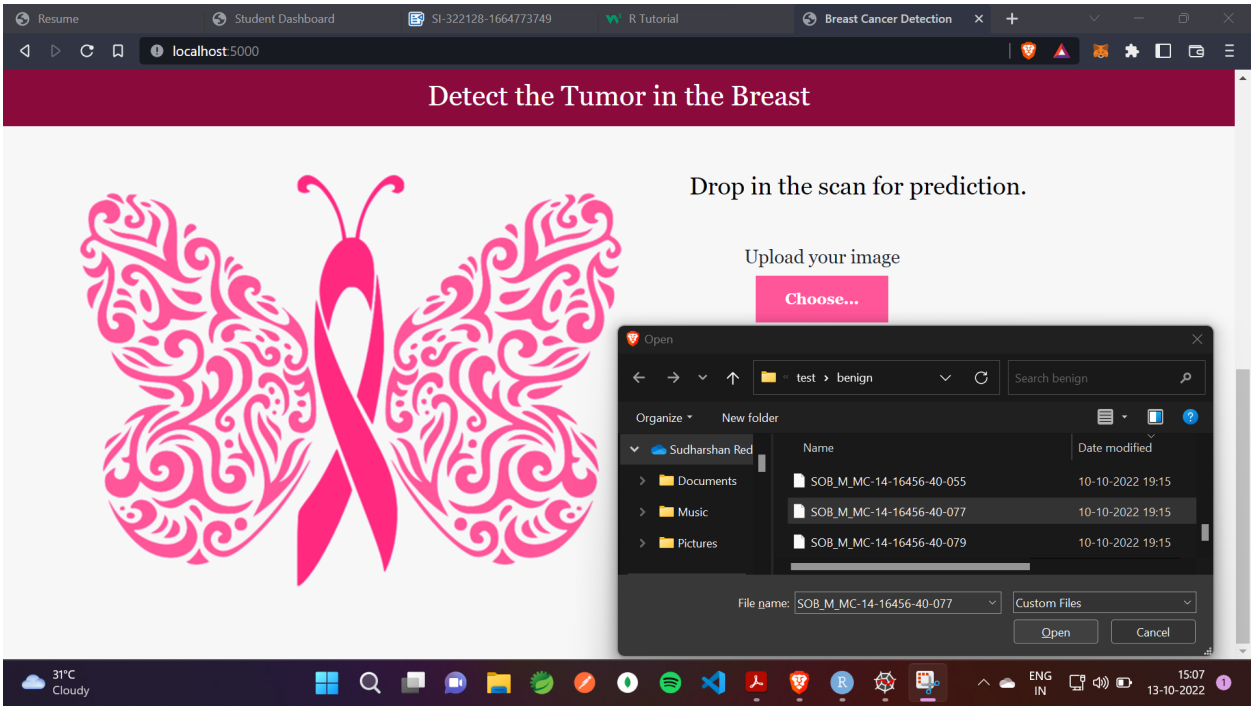
Resume
Student Dashboard
SI-322128-1664773749
R Tutorial
Breast Cancer Detection
localhost:5000
Detect the Tumor in the Breast
Drop in the scan for prediction.
Upload your image
Choose...
Open
test › benign
Search benign
Organize
New folder
Sudharshan Red
Documents
Music
Pictures
Name
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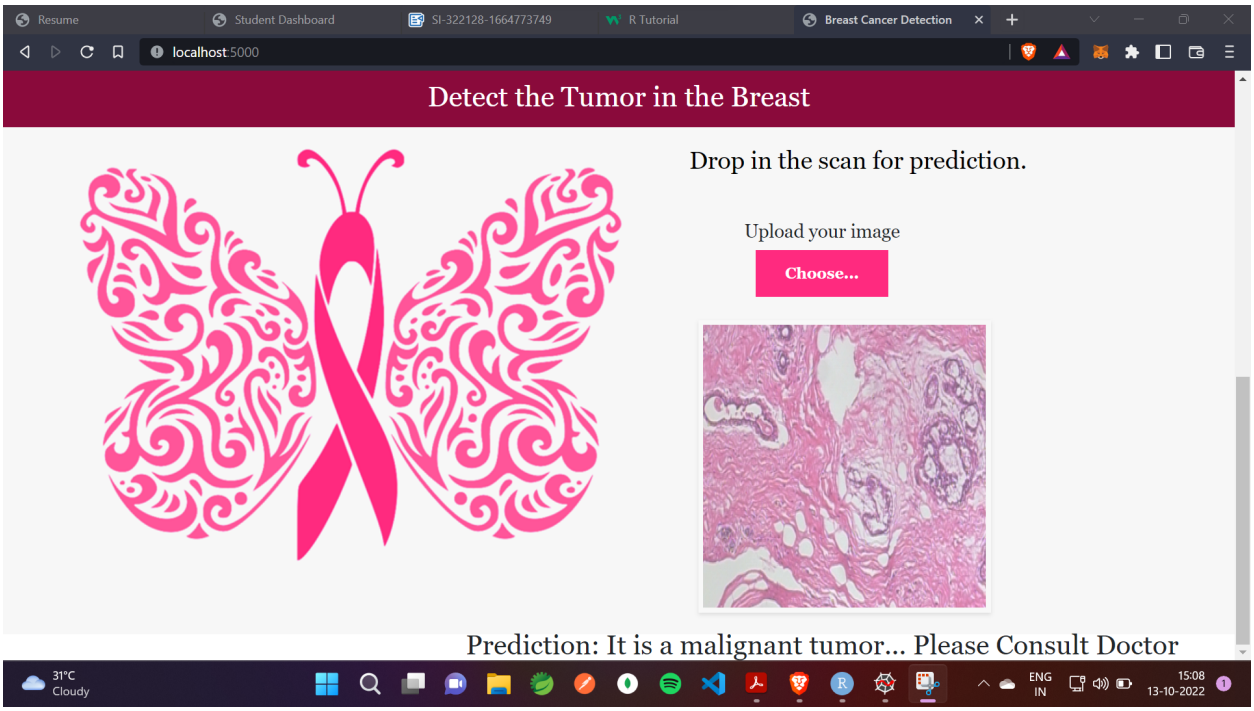


7. ADVANTAGES AND DISADVANTAGES

Advantages:

- Early detection and prevention can significantly reduce the chances of death
- Increased accuracy for Breast cancer risk prediction.
- Reduce the time complexity.

Disadvantages:

- Requires massive datasets to train on.
- Time consuming and more resources required.

8. APPLICATIONS

- Deep learning and Neural networks are key technologies used in the breast cancer risk prediction .

- It presents the results obtained by processing input from uploading image.

9. CONCLUSION

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

10. FUTURE SCOPE

The project can be further enhanced by deploying the deep learning model obtained using a web application and larger dataset could be used for prediction to give higher accuracy and produce the better result.

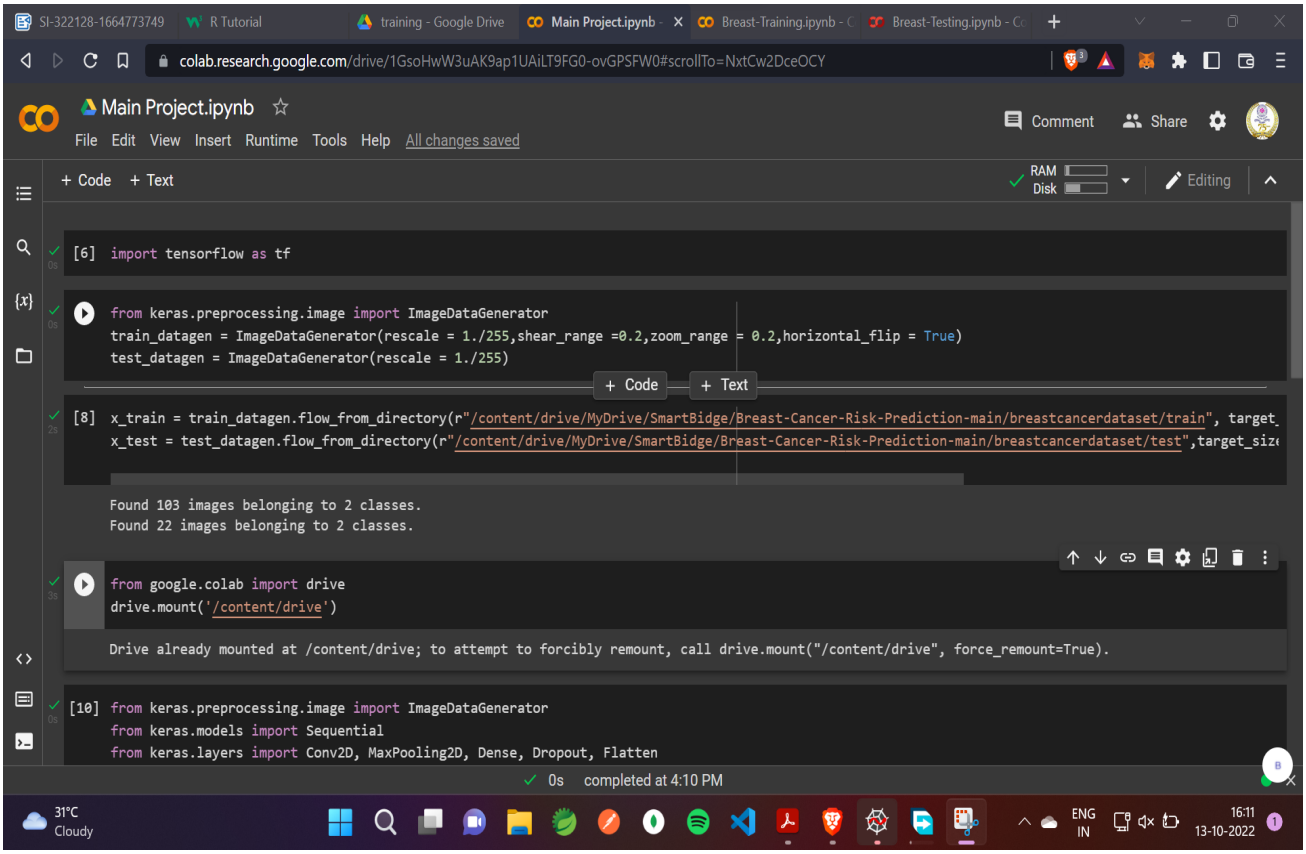
11. BIBILOGRAPHY

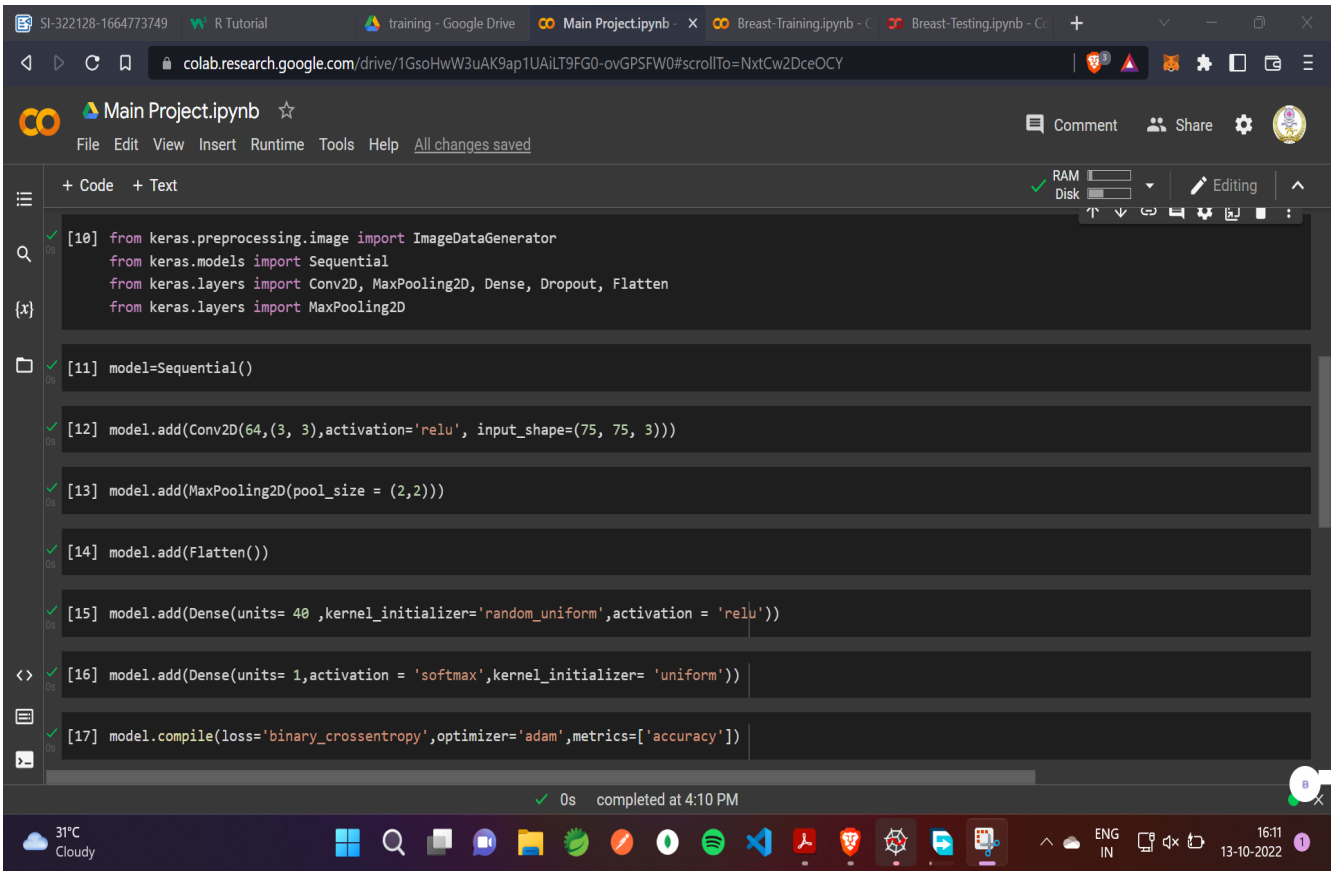
- Radiology , Breast cancer risk prediction using deep learning by *Min Sun Bae,MD,PhD and Hyug-Gi Kim, PhD*.
- Deep Learning and Convolutional Neural Networks for Medical Imaging and Clinical Informatics by *Le Lu, Xiasong Wang, Gustavo Carneiro and Lin Yang*

APPENDIX

Source Code

- Main_Project.ipynb




Main Project.ipynb
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Editing
[10] from keras.preprocessing.image import ImageDataGenerator
from keras.models import Sequential
from keras.layers import Conv2D, MaxPooling2D, Dense, Dropout, Flatten
from keras.layers import MaxPooling2D
[11] model=Sequential()
[12] model.add(Conv2D(64,(3, 3),activation='relu', input_shape=(75, 75, 3)))
[13] model.add(MaxPooling2D(pool_size = (2,2)))
[14] model.add(Flatten())
[15] model.add(Dense(units= 40 ,kernel_initializer='random_uniform',activation = 'relu'))
[16] model.add(Dense(units= 1,activation = 'softmax',kernel_initializer= 'uniform'))
[17] model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
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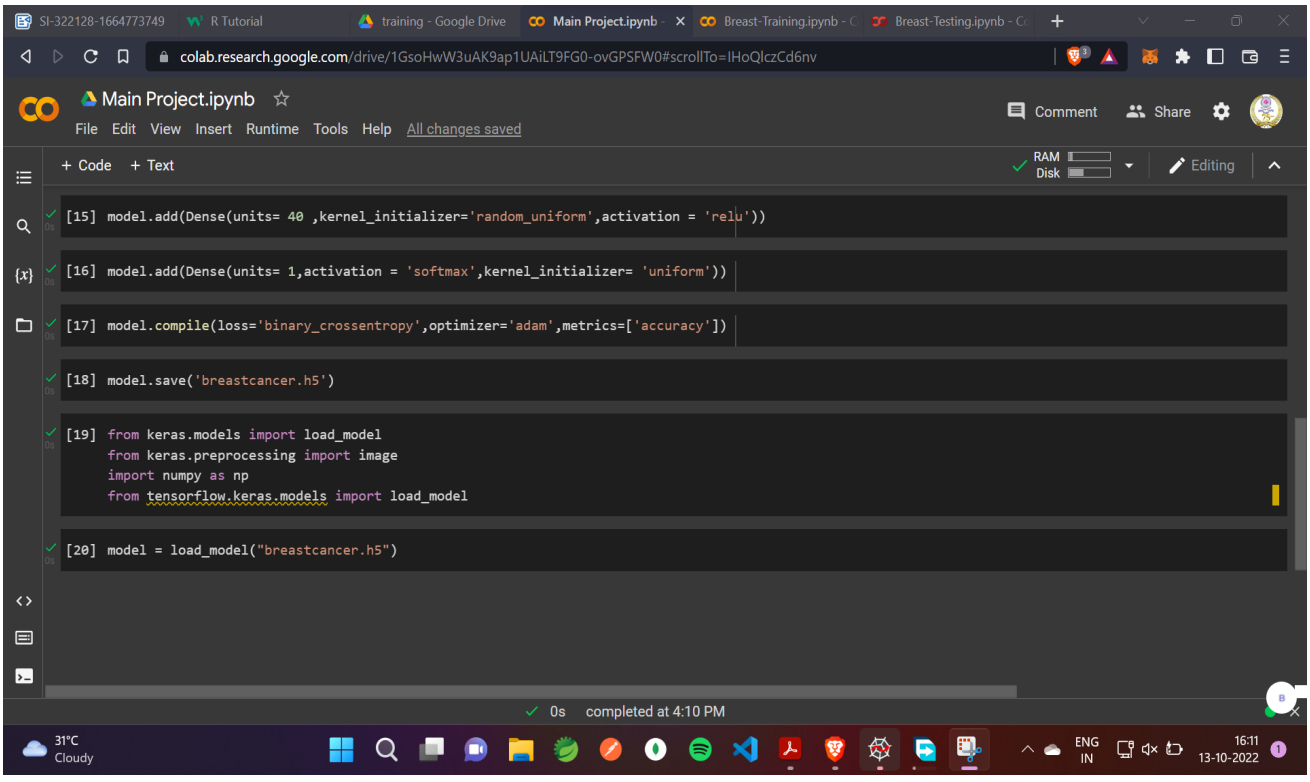
Main Project.ipynb
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[15] model.add(Dense(units= 40 ,kernel_initializer='random_uniform',activation = 'relu'))
[16] model.add(Dense(units= 1,activation = 'softmax',kernel_initializer= 'uniform'))
[17] model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
[18] model.save('breastcancer.h5')
[19] from keras.models import load_model
from keras.preprocessing import image
import numpy as np
from tensorflow.keras.models import load_model
[20] model = load_model("breastcancer.h5")
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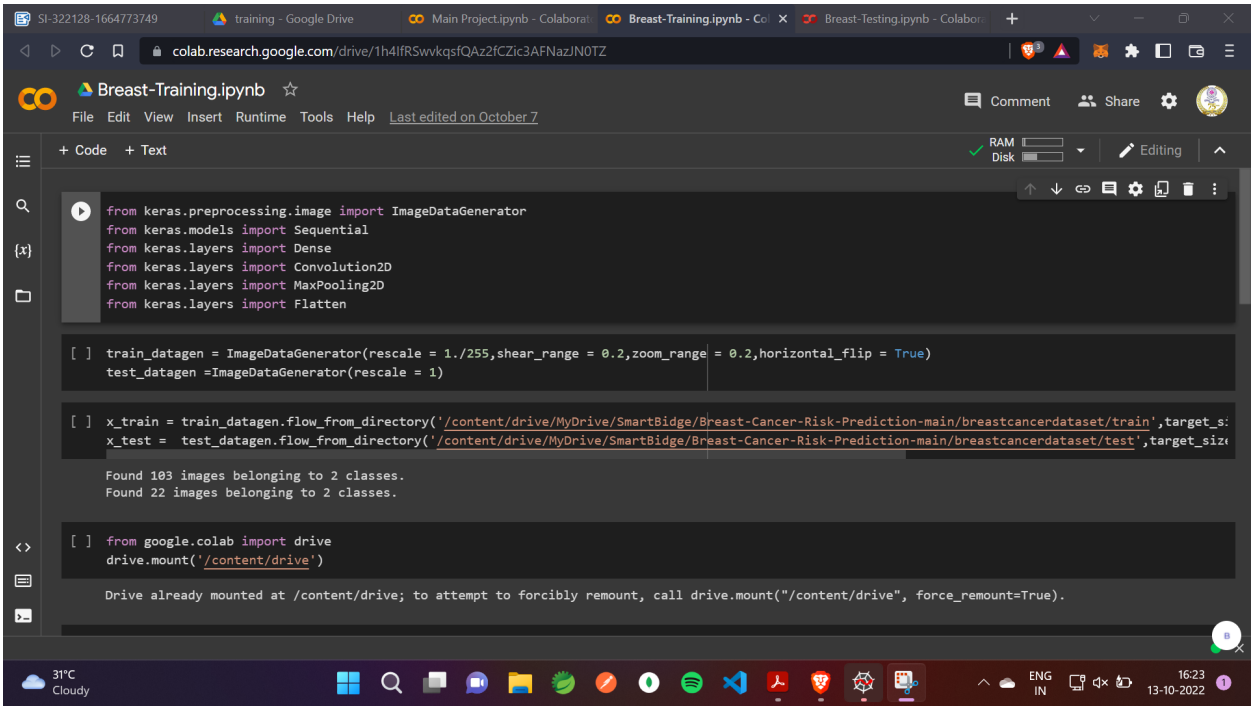
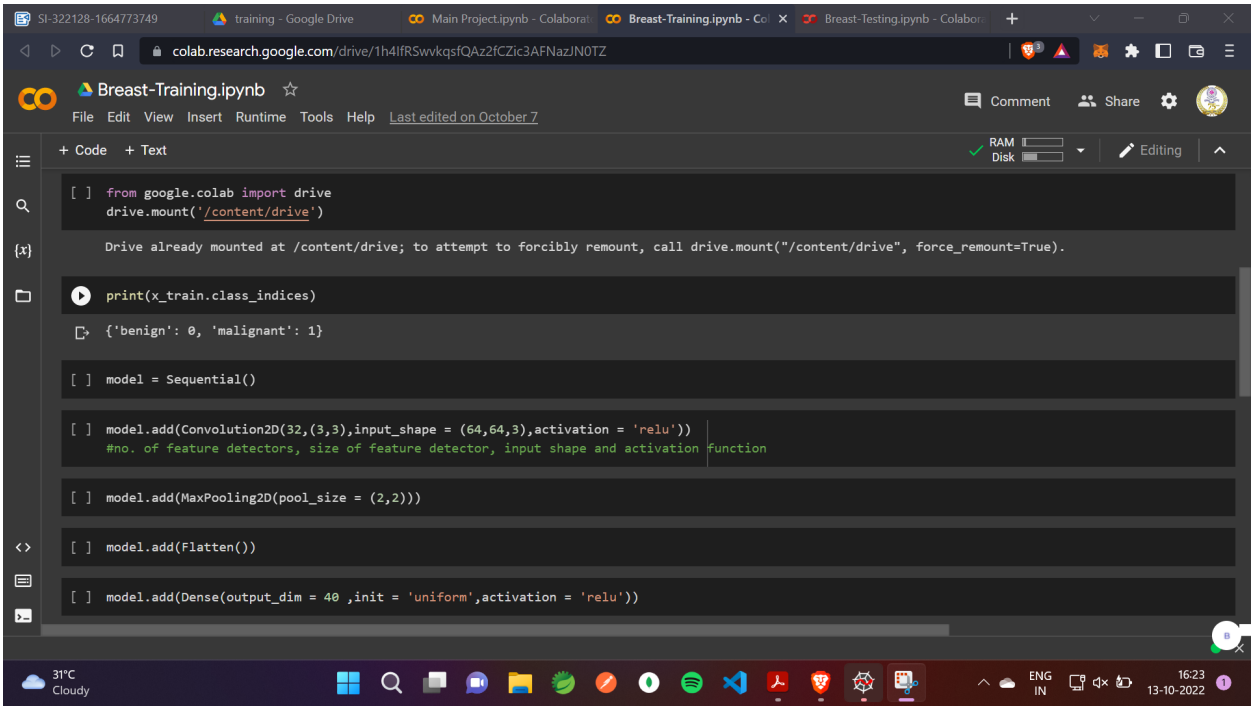
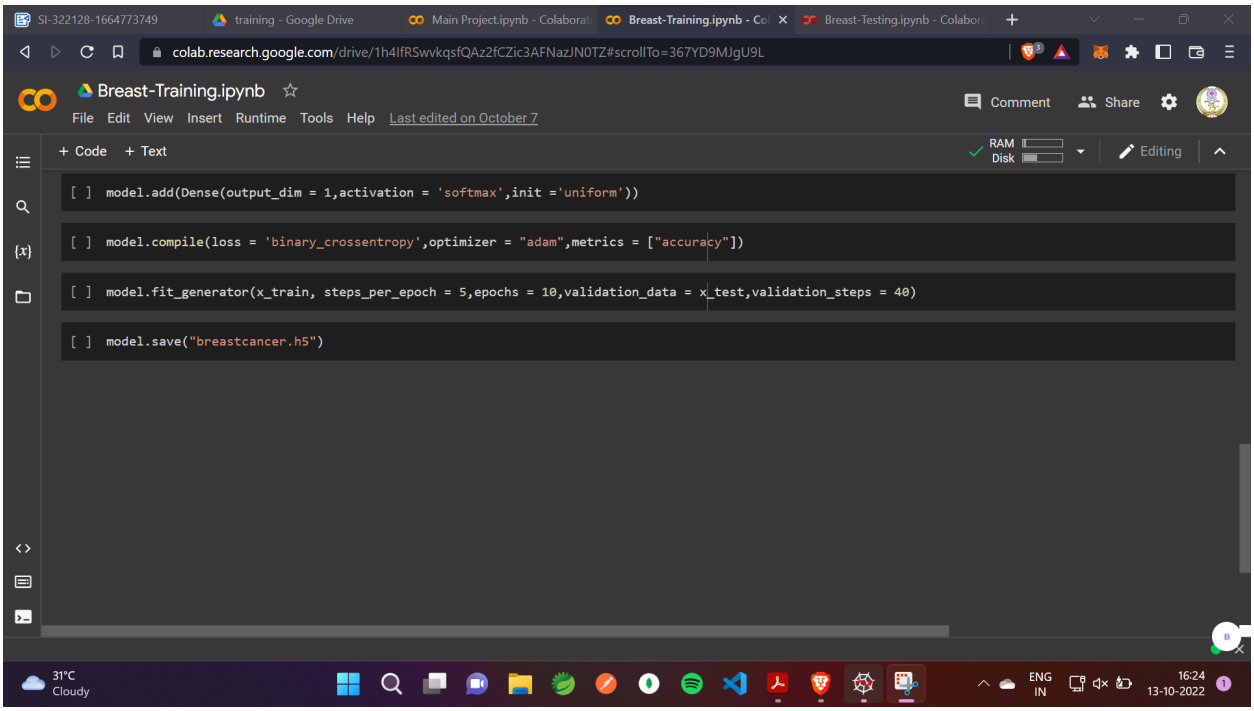
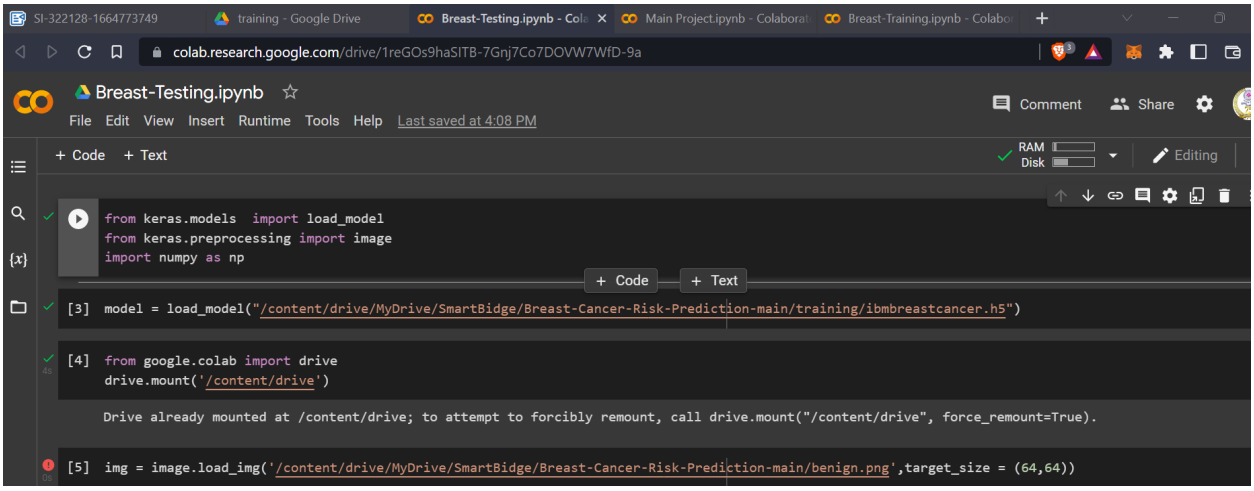
- Breast-Training.ipynb

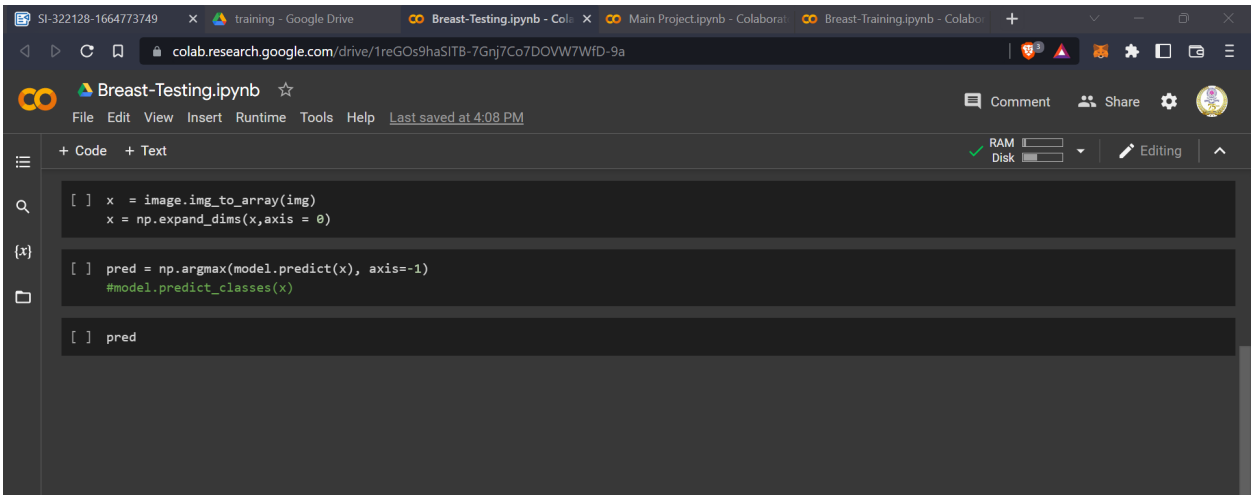






- Breast-Testing.ipynb

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training - Google Drive
Breast-Testing.ipynb - Cola
Main Project.ipynb - Colaborat
Breast-Training.ipynb - Colabor
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Breast-Testing.ipynb
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+ Code + Text
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Editing
[ ] x = image.img_to_array(img)
x = np.expand_dims(x,axis = 0)
[ ] pred = np.argmax(model.predict(x), axis=-1)
#model.predict_classes(x)
[ ] pred