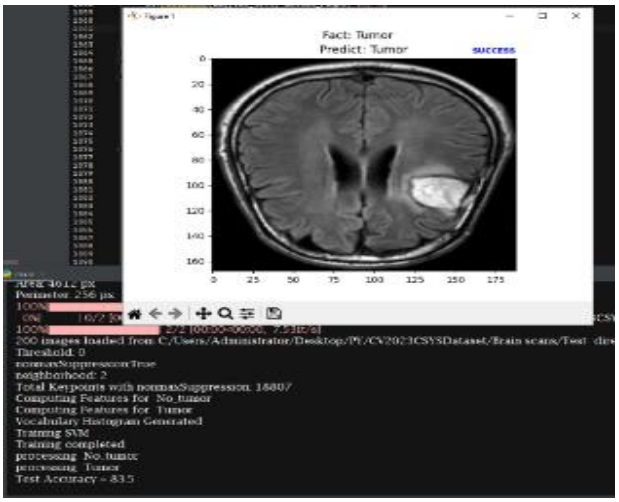
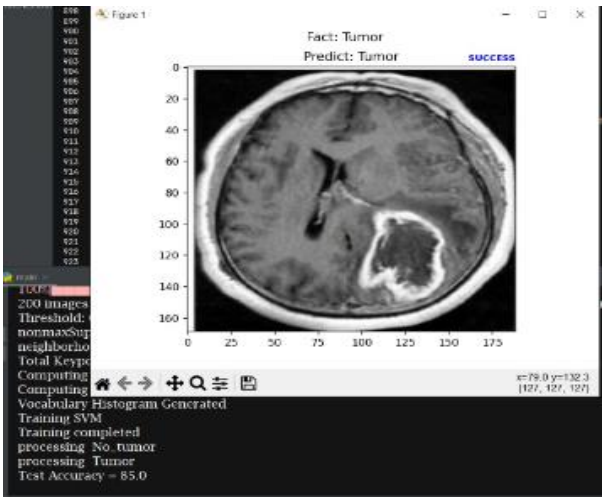
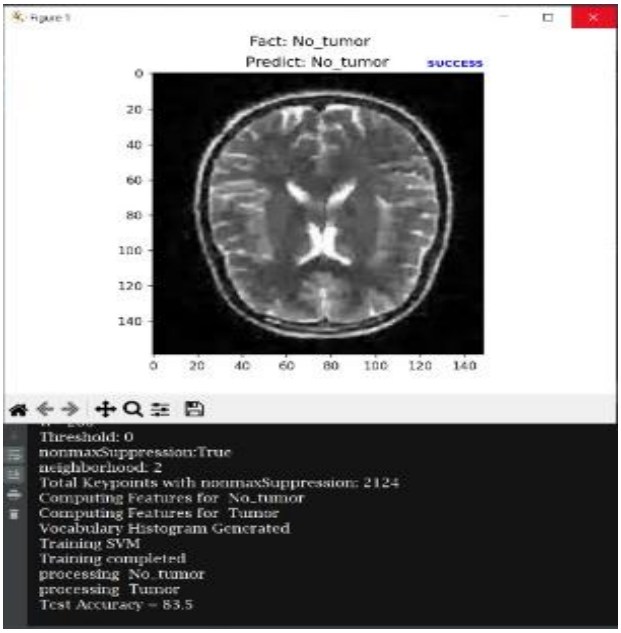
BOW Model for brain Data :

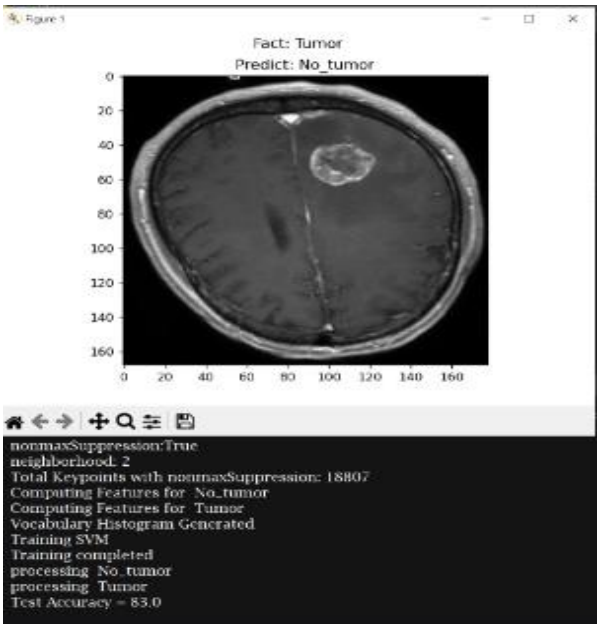
-The bag-of-words model is commonly used in methods of document classification where the occurrence of each image is used as a feature for training a classifier.

-test fact VS predict:

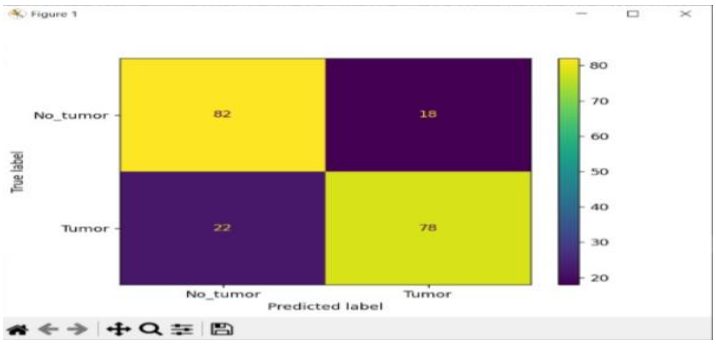




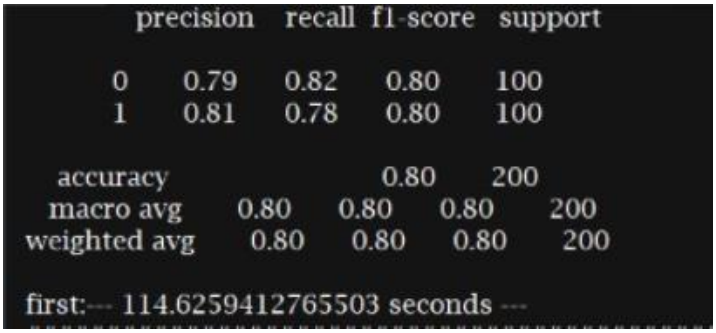




-Brain MIR classification :[82 18]



-precision recall f1-score support:



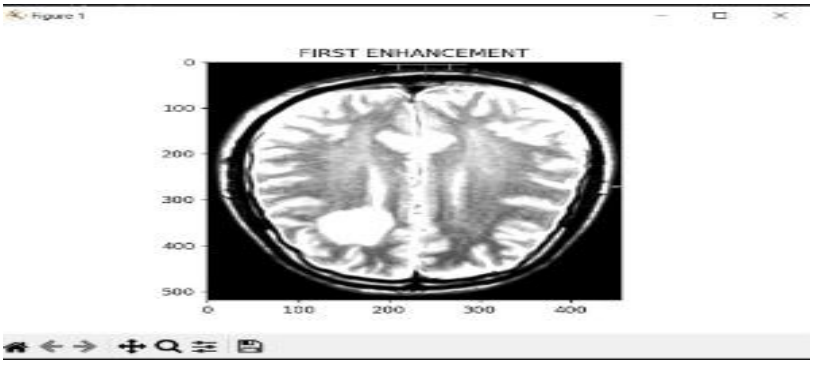
-For preprocessing :

First apply GaussianBlur filter by.

cv.GaussianBlur(copy,(5,5),2)

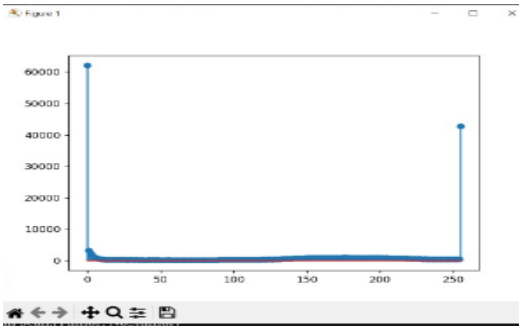
cv.add(copy,(cv.add(blur,-100))) in order to avoid over-brightness of the image, blurred intensities are reduced -100

plt.imshow(enh, cmap='gray', vmin=0, vmax=255),plt.title("FIRST ENHANCEMENT")



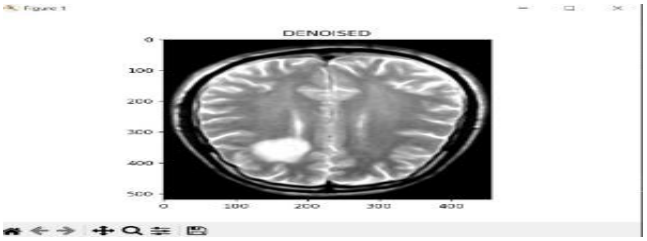
-then make Histogram by

np.histogram function .



-then denoising the images to clear by

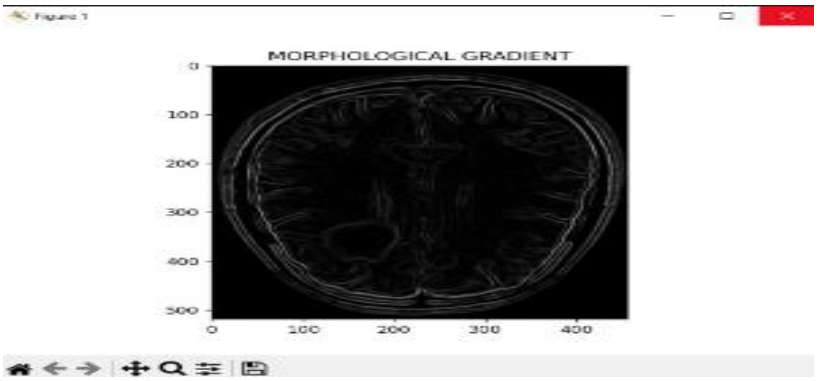
median = cv.medianBlur(img,7).



-Morphological Gradient :

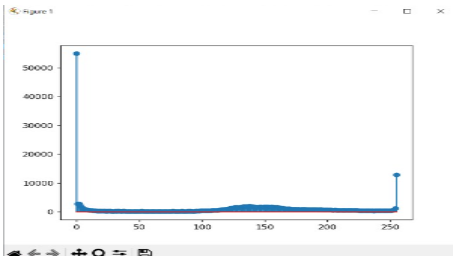
to learn different morphological operations like Erosion

cv.getStructuringElement(cv.MORPH_CROSS,(3,3))



-then np.percentile(enh2,85)

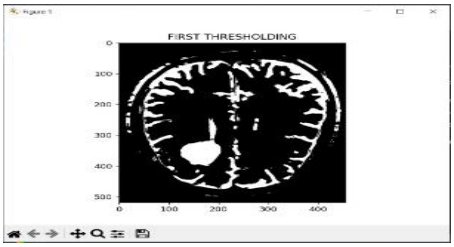
to Compute the q-th percentile of the data along the specified axis.



-Using THRESH :

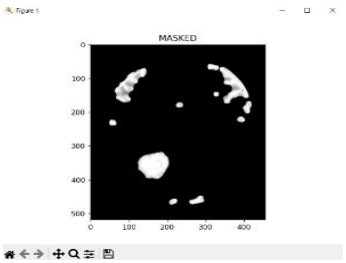
cv.threshold(enh2, t, 255, cv.THRESH_BINARY)

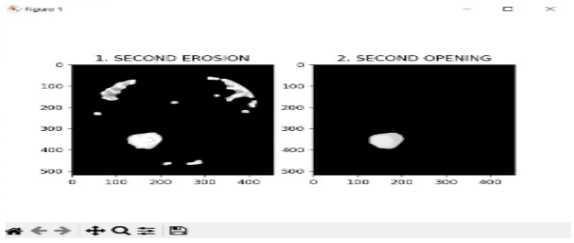
The threshold value is the mean of the neighbourhood area minus the constant C. cv. ADAPTIVE_THRESH_GAUSSIAN_C: The threshold value is a gaussian-weighted sum of the neighbourhood values minus the constant C.



-Then apply masking on images by:

cv.bitwise_and(copy, copy, mask=dilation) to detect the tumer in images





- Second round of morphology operations :

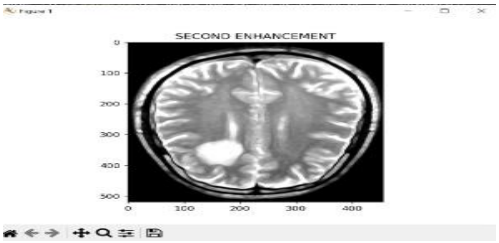
Morphological transformations are some simple operations based on the image shape. It is normally performed on binary images. It needs two

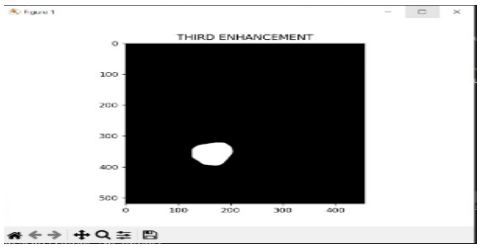
inputs, one is our original image, second one is called structuring element or kernel which decides the nature of operation. Two basic morphological operators are Erosion and Dilation. Then its variant forms like Opening, Closing, Gradient etc also comes into play

Using cv.erode(masked,kernel,iterations = 1)

-enhance : by apply gaussian filter

cv.GaussianBlur(final,(3,3),0)





-function for loading data: to load data and its label(0notumor , 1tumor)

-**grid plot**: to Create a grid plot for desired number of images (n) from the specified set.

load_data(dir_path,trainORtest="Train",img_size=(600,600))

plot_samples(x, y, labels_dict, n=50)

- extreme points :to Find the extreme points on the image and crops the rectangular out of them.

crop_imgs_enhance(set_name, add_pixels_value=0)

-visualization: to add contour on the image

cv.drawContours(img.copy(), [c], -1, (0, 255, 255), 12)

-Add extreme points:

img_pnt = cv.circle(img_cnt.copy(), extLeft, 8, (0, 0, 255), -1)

-**crop**:

crop_imgs_enhance(set_name=x_train)

crop_imgs_enhance(set_name=x_test)

-after cropping apply canny:

The Canny edge detector is an edge detection operator that uses a multi-stage algorithm to detect a wide range of edges in images .

Canny edge detection is a technique to extract useful structural information from different vision objects and dramatically reduce the amount of data to be processed.

-fast corner: by cv.FastFeatureDetector_create

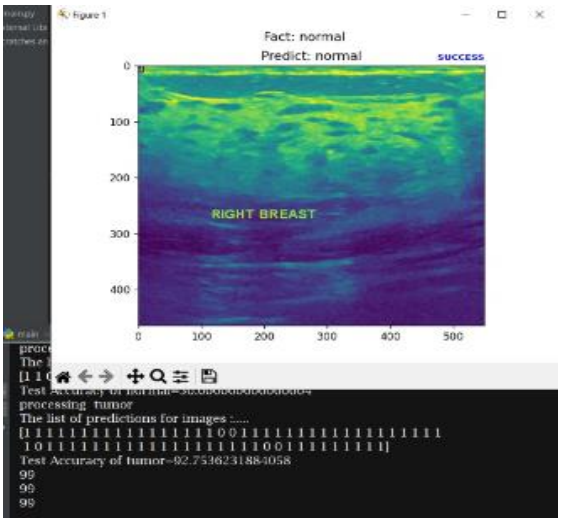
-then apply BOV:

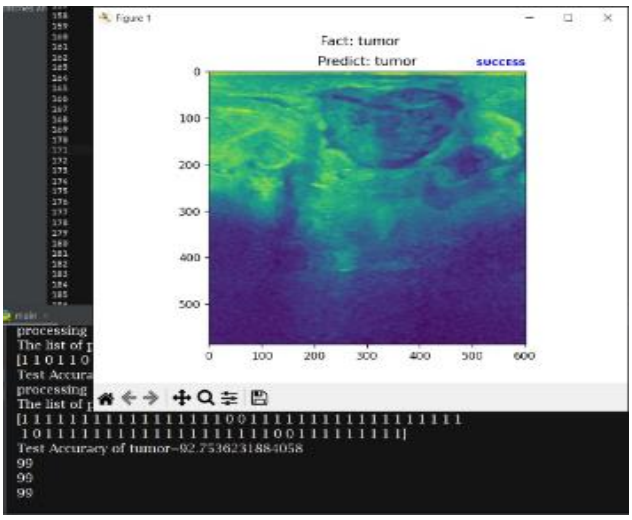
The bag of visual words (BOV) model is one of the most important concepts in all of computer vision. We use the bag of visual words model to classify the contents of an image. It's used to build highly scalable (not to mention, accurate) CBIR systems.

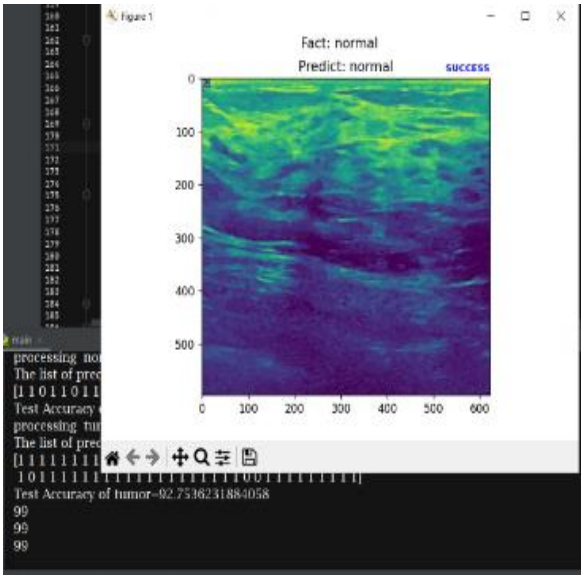
BOV(no_clusters=20,x_train=X_train_crop_list,y_train=y_train,labels0 =labels,x_test=X_test_crop_list,y_test=y_test,labels1=_)

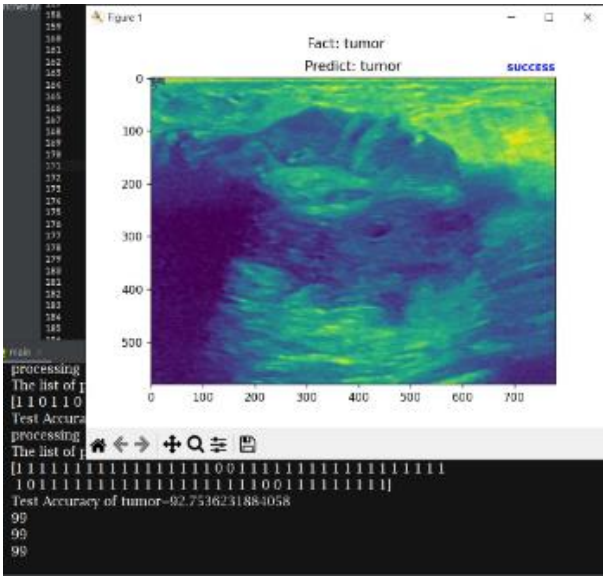
Hog model for Breast Data:

-test fact VS predict:









-For preprocessing :

resize for all image in training to (128, 64)

then creating hog features to extract features from image data and save the result in variable "hog_image ".

-apply SVM model on the result of HOG in training and testing for classification then calculate the accuracy for training and testing by calculate the mean of all predictions .