Project: Machine Learning Approach for Brain Tumor Detection and Classification

Problem Statement: Given a set of raw MRI images, correctly detect, classify and label them as benign, malignant and no_tumor using a machine learning algorithm.

In the Solution…

Folders:

- **"1.raw_mri"** folder contains all the raw MRI images that is used to build the model.
- **"2.train_binary"** and **"3.train_tumor_detected"** folders contain processed binary images.
- **"4.input"** folder in turn contains the 3 other folders, namely "benign", "malignant", and "no_tumor". Where, "benign" folder contains binary MRI images which are of type benign. Same in case of malignant and no_tumor also.
- **"5.test_sample"** folder contains raw MRI images which are used for testing the model.
- **"6.test_binary"** and **"7.test_tumor_detected"** folders contain the processed binary images of the raw images present in '5.test_sample'.
- **"model"**: The trained model is saved into this folder.

Python Files:

- **"0_Visualized_Tumor_Detection.pynb"**: It visually highlights the tumor for one image at a time.
- **"1_Pre-Processing.pynb"**: It converts the raw MRI image to binary image.
- **"2_Feature_Extraction.pynb"**: Extracts features like 'Contrast', 'Energy', 'Homogeneity', 'Correlation', 'Dissimilarity', 'ASM', 'Area', 'Perimeter', 'Epsilon', 'Is Convex'.
- **"3_Train_Model.pynb"**: Train the model using the extracted data.
- **"4_Test_Classification.pynb"**: Testing the model performance.

Other Files:

- **"data.csv"**: All the extracted features along the class label of the MRI image is stored into the csv file.
- **"rf_model.pkl"**: Trained Random forest model.