Embeddings for Medical Image Retrieval (EMIR)

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Problem Statement

- Companies need to process large amounts of images daily
- Dealing with .jpg, .png, etc… file types can be tedious and time consuming
- Companies must be wary of patient privacy laws

Solution

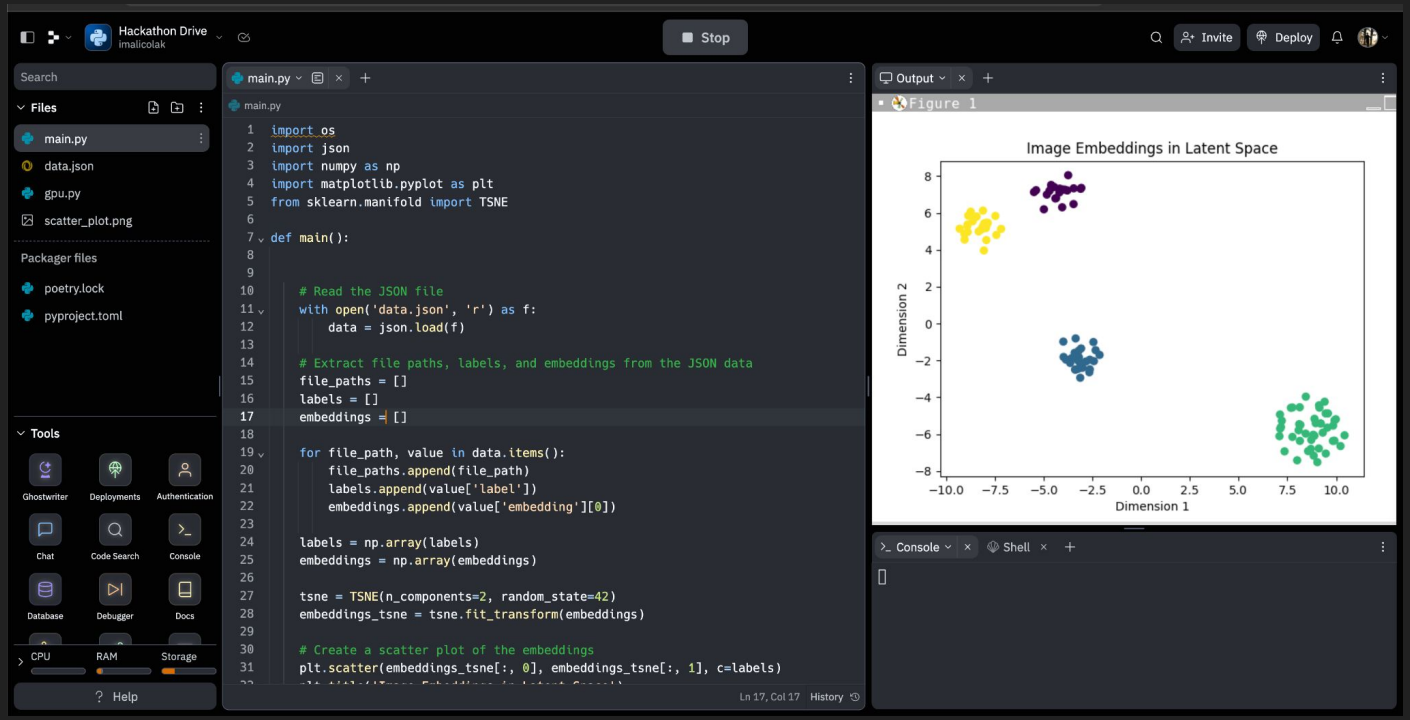
- Convert raw images into embedding representations using a neural network that still contain the original image information
- Embeddings can be processed for common tasks such as clustering, classification, and image retrieval
- Dimensionality reduction of embeddings enables faster and more memory efficient operations on image data

Implementation Details

- Gather example dataset from the internet
- Implement a ResNet18 neural network with final classification layers removed
- Store the embeddings created by the layers of the neural network
- Translate all embeddings into a lower dimensional latent space using principal component analysis
- Plot all points to retrieve clusters

Example Dataset

Replit Integration



Final Latent Space Graph