Create Class and def

https://www.w3schools.com/python/python_classes.asp
https://www.w3schools.com/python/python_functions.asp

Convert from image numpy to image torch

https://www.tutorialspoint.com/how-to-convert-an-image-to-a-pytorch-tensor

Pytorch tensor to numpy array

```
predictions_np = predictions.cpu().detach().numpy()
flair_np = flair.cpu().detach().numpy()
```

How get shape of image

For color image	height, width, channel = im.shape
For grayscale (monochrome) images	height, width = im.shape

overlay a smaller image on a larger image python OpenCv

```
alpha_s = predictions_np[:, :, 2]
alpha_l = 1.0 - alpha_s

for c in range(0, 3):
   predictions_np[:, :, c] = (alpha_s * predictions_np[:, :, c] + alpha_l * flair_np[:, :, c])
```

Numpy Examples:

- np.transpose
  https://www.w3resource.com/numpy/manipulation/transpose.php
- Combining Two Images with OpenCV (np.concatenate)

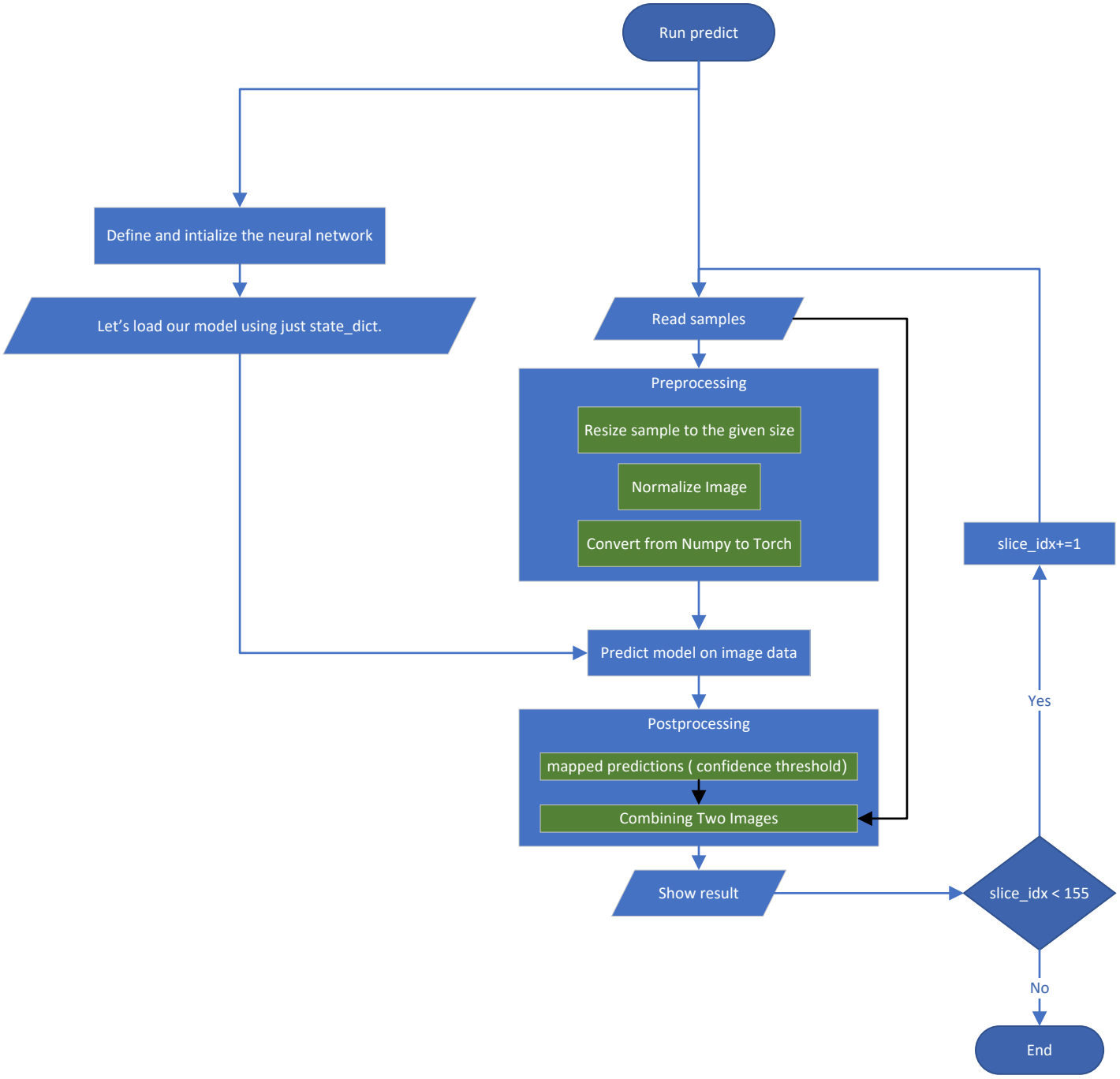
To stack vertically (img1 over img2)	vis = np.concatenate((img1, img2), axis=0)
To stack horizontally (img1 to the left of img2)	vis = np.concatenate((img1, img2), axis=1)

- How to convert 0-1 image float array to 0-255 int array

```
img*=255
img = img.astype(np.uint8)
```

Saving and Loading Models in pytorch

Saving Model for Inference	torch.save(model.state_dict(), PATH)
Loading Model for Inference	model = FCN(… , …) model.load_state_dict(torch.load(PATH)) model.eval()
Save Entire Model	torch.save(model, PATH)
Load Entire Model	model = torch.load(PATH) model.eval()


Run predict
Define and intialize the neural network
Let’s load our model using just state_dict.
Read samples
Preprocessing
Resize sample to the given size
Normalize Image
Convert from Numpy to Torch
Predict model on image data
Postprocessing
mapped predictions (confidence threshold)
Combining Two Images
Show result
slice_idx+=1
slice_idx < 155
Yes
No
End