Module 2- Exercise

I trust that you now have a solid understanding of medical image analysis (Classification and Semantic Segmentation). With that foundation, I would like you to proceed with the following tasks.

Task 1: Perform the polyp characterization using models from VGG family (VGG16/19), ResNet Family (ResNet18/50/101/152), DenseNet, EfficientNet, MobileNet.

First, write half a page to one page about the model you've selected. For example, if you're using MobileNet, you should explain what MobileNet is, highlight the key aspects of its architecture, and describe its working principles.

After Implemnting your model for Polyp Characterization, make sure you implemented Early Stopping with Patience (4/5/6). Then Tabulate the following performance metrics.

Table 1: Results.

Model	Pretrained 'or' Scratch	Accuracy (%)	Sensitivity (%)	Specificity (%)	F1 Score	AUC
model (Yours)	Scratch					
Model (member2)	Pretrained					
model (member 3)	Pretrained					

Finally, report the ROC curves and confusion matrices for the three models run by your group.

Task 2: Perform the Semantic Segmentation using UNet/PSPNet/UNet++/AttentionUnet/TransUnet.

First, write half a page to one page about the model you've selected. For example, if you're using UNet++, you should explain what it is, highlight the key aspects of its architecture, and describe its working principles.

Play with different losses: Select one loss function from DiceBCE Loss, Dice Loss, BCE Loss, IoUBCELoss, MSE Loss functions. Tabulate the performance metrics.

Table 2: Results.

Model	Jaccard	F1 Score	Recall	Precision	Accuracy
Dice Loss					
your model					
member1 model					
member2 model					

Finally, report the segmented output of any 2 test images.