Assignment-3
SML

Q1) Using neural network approach, create a simple calculator for arithmetic operations (+,-,x,/) between 2 complex numbers. Create the dataset required for this yourself. You can use the scikit-learn library for this question. Evaluate the performance of such a calculator using appropriate evaluation metrics.
[6 marks]

Q2) Implement a decision tree from scratch and apply it on the IRIS dataset.
[6 marks]

Q3) Implement a multi-task neural network from scratch (incl. back-propagation) having the following attributes:

(i) 2 inputs (both continuous)
(ii) 2 hidden layers (one has sigmoid and another has tanh as the activation function)
(iii) 2 outputs (one for binary classification and another for regression)

Please find the relevant dataset attached. Use stochastic gradient descent approach and have 80:20 split for training and validation.
NOTE: For such multi-task learning problems, you can do a weighted addition of the losses involved.
[8 marks]