SMAI Assignment-5 Report
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Question - 1

1. **Best Performing Architecture:**

Accuracy	: **73.29**
Number of hidden layers	: **1**
Number of nodes in each hidden layer	: **512**
Activation function	: **ReLu**
Loss Function	: **Cross Entropy with Softmax**

2. **Effect of various activation function:**

Activation Function	ReLU	Sigmoid	Tanh
Accuracy	70.15	48.4	69.3

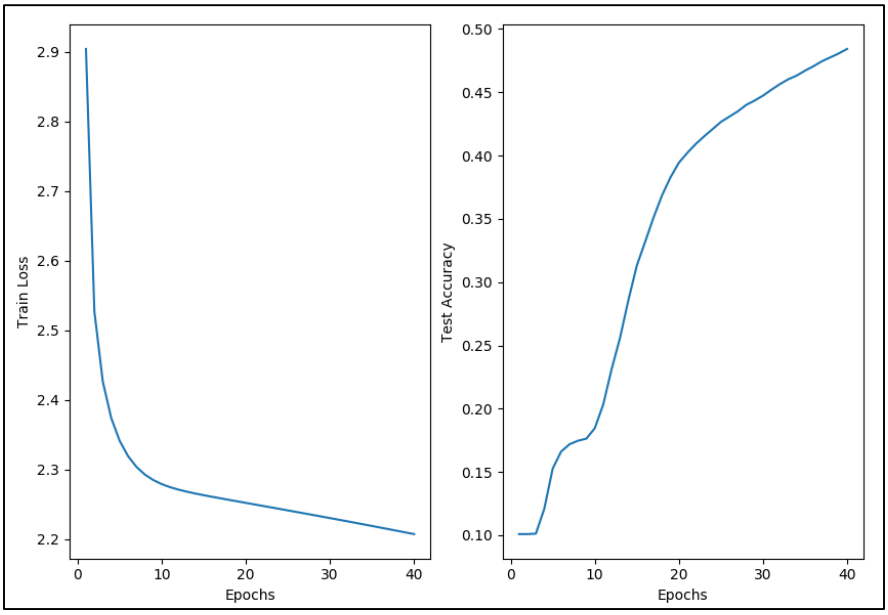


Fig 1: Train Loss and Accuracy Vs # Epochs using **Sigmoid**

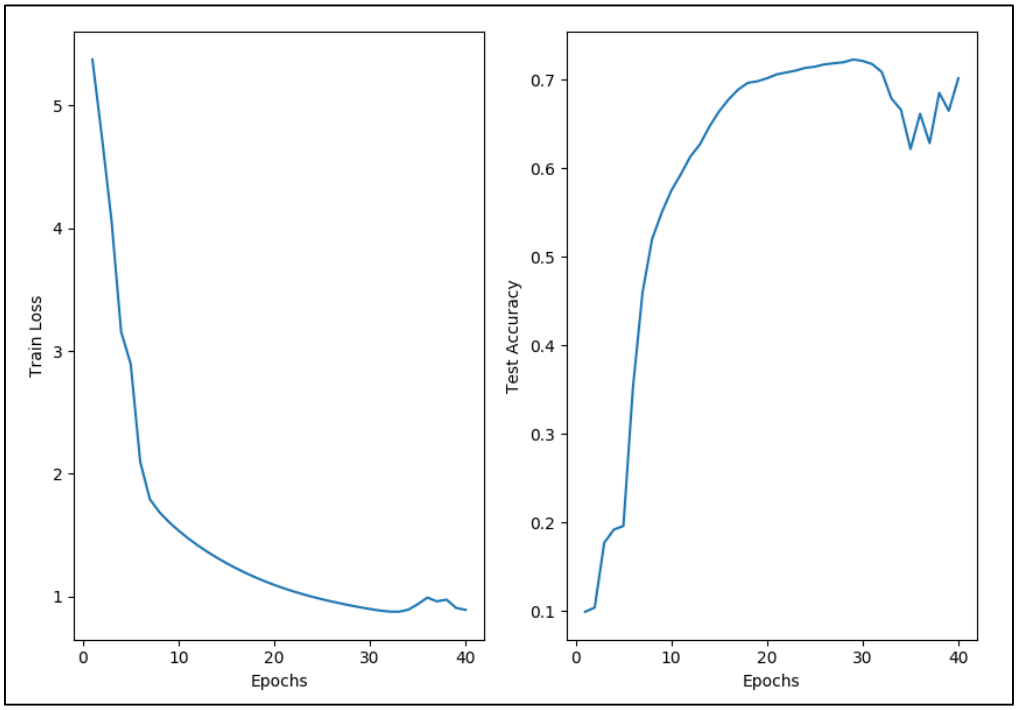


Fig 2: Train Loss and Accuracy Vs # Epochs using **ReLU**

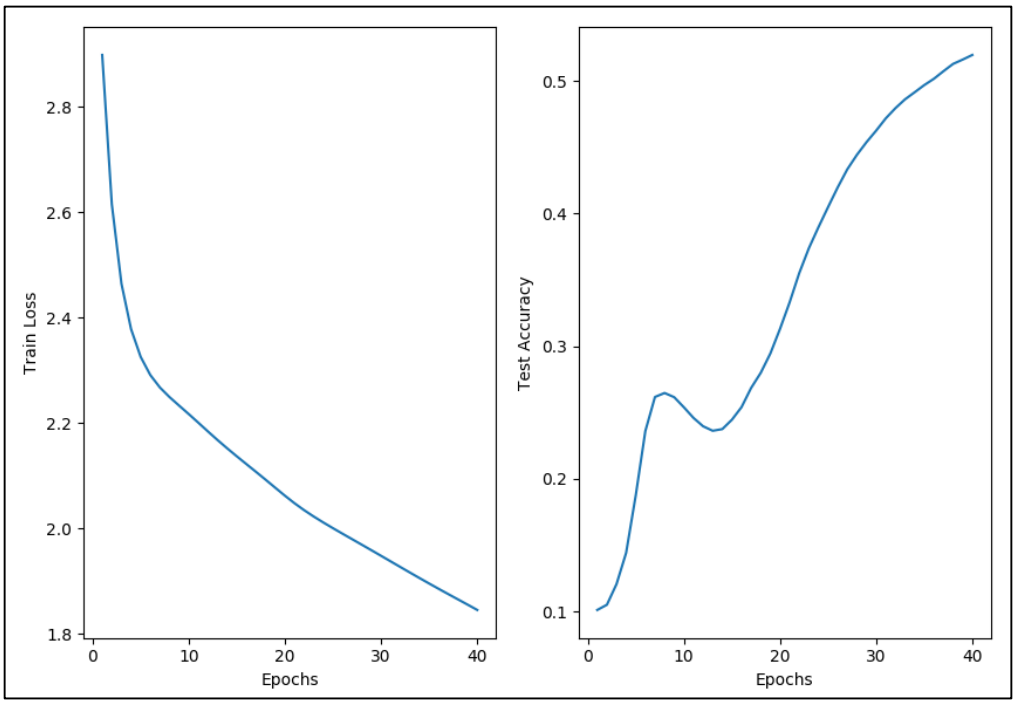
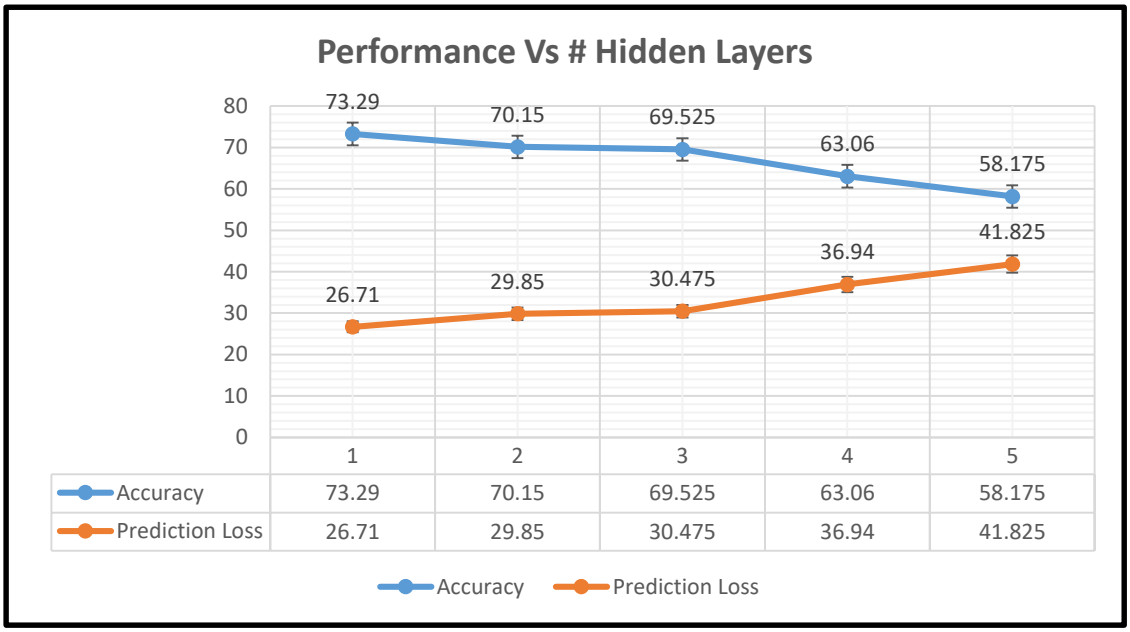


Fig 3: Train Loss and Accuracy Vs # Epochs using **Tanh**

3. **Effect of number of layer on performance:**

Following graph shows the Prediction Loss Vs Number of Layers



4. **Effect of number of Epochs on performance:**

Following graph shows the Epochs Vs Number of Layers

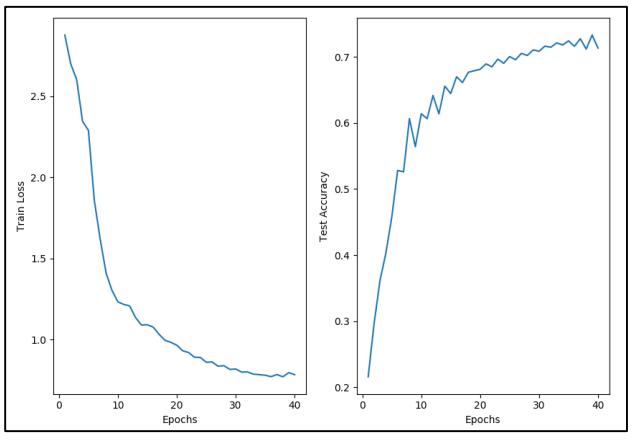


Fig 4: Performance Vs Epochs for **# Hidden 2 Layer**

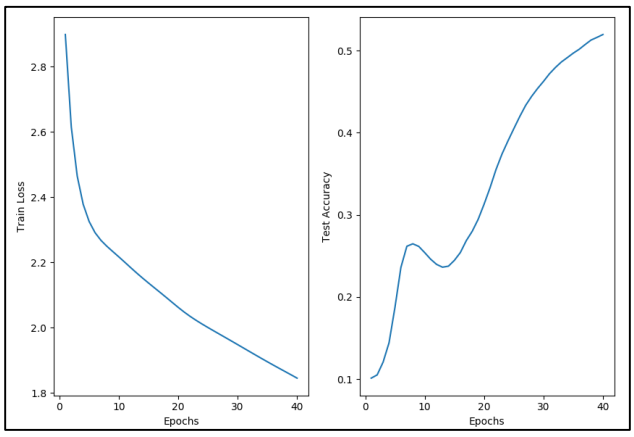


Fig 4: Performance Vs Epochs for **# Hidden 2 Layer**

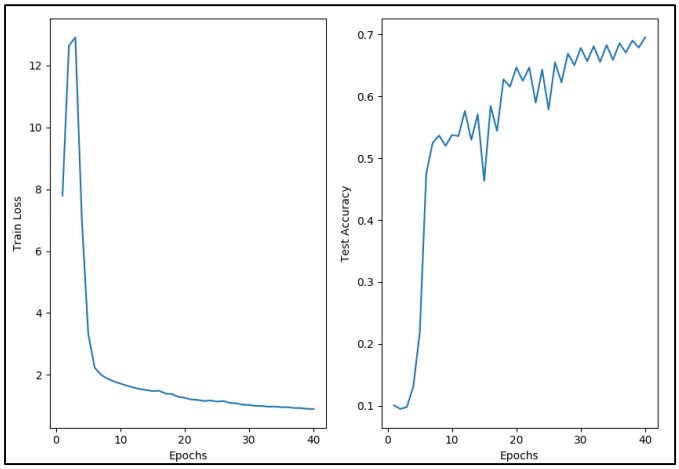


Fig 4: Performance Vs Epochs for **# Hidden 3 Layer**

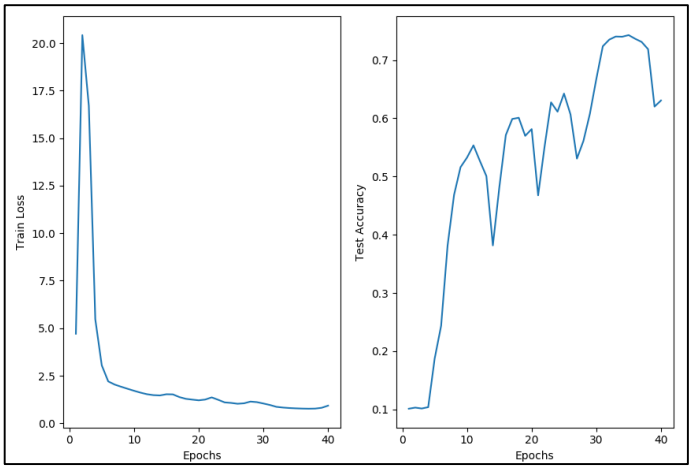


Fig 6: Performance Vs Epochs for **# Hidden 4 Layer**

Question - 2

The following are the required modifications to use the neural network for the given task:

1. Since there are few categorical features, we have to first one hot encode them.
2. Since it is a regression problem, we will use **Mean Absolute Error** as the loss function.
3. Since we are trying to predict the price of the house, which is a single numerical value, we will have only **one node in output layer**.
4. We will use **Linear as the output activation function**, since we want the exact predicted values of the price of the house.