Question 4

The Final Validation Accuracy is: 0.66286

The Final Test Accuracy is: 0.66949

Ensemble process:

We use three neural network models to implement bagging ensemble. We first randomly sample with replacement from the training dataset. Then we train three different neural networks independently for each training sample. These three neural networks are independent and can run individually. After all models are trained, we use them to make predictions separately, and we take the average of each of their predictions as our final prediction.

Better or Not:

No, the bagging model is about the same performance as the single neural network model, so it doesn't improve the performance.

Reason:

Ensembling the same model trained on different data subsets lacks model diversity, which does not always improve the model performance.

Additionally, the small training subset could be another problem. When the training set is small, there could be an issue that the training subset is even smaller, so that each model is not well trained, which results in poor performance.