Name:Gabrielle Scott

ybID: 620149334

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Lec: Dr. Matthew Stone

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Accuracy rates of models

After analyzing the provided data, I developed and evaluated four distinct models: The sequential Keras Tensorflow Neural Network, The Logistic regression model, The Sequential Keras Tensorflow Neural Network(100 neurons), and the Support Vector Model. Here is a quick summary of these models' accuracy:

1. Simple Neural Network
   - Accuracy: 0.8834 (88.34%)

2. Logistic regression model
   - Accuracy:0.8694375(86.98%)

3. 100 Neuron Neural Network
   - Accuracy: 0.8589 (85.89%)

4. Support Vector Model
   - Accuracy:0.921875 (92.18%)

5. DecisionTreeClassifier

   - Accuracy:0.8774375 (87.74%)

Following an assessment of the four models, the Support Vector Model emerged as the top performer, boasting the highest accuracy. With an impressive accuracy score of 92.18%, it demonstrated superior predictive capability compared to the other tested models. These results imply that the Support Vector Model is the most dependable choice for making precise predictions based on the provided data.

The importance of normalization.

The importance of normalization in the context of artificial intelligence (AI) cannot be overstated. Machine learning algorithms in artificial intelligence heavily rely on numerical data to create well-informed judgments and predictions. By bringing all characteristics to a uniform scale through normalization, training and inference data are guaranteed to be standardized. By doing this, it avoids having some features take over the learning process because of their bigger magnitudes, which can result in biased findings. The accuracy of models is increased, algorithms can converge more quickly, and generalizability to new and unexplored data is improved. It is a vital phase in the pipeline of AI development and deployment since it lays the way for AI systems to be more durable, effective, and reliable.

The use of a neural network with a lot of parameters

Overfitting is a common issue in neural networks where the model becomes excessively specialized in learning the training data, leading to poor generalization on unseen data. The number of parameters in the neural network significantly affects overfitting, as an overly large number of parameters results in increased complexity and memorization of noise in the training data. Regularization techniques, like L1 and L2 regularization or dropout, are used to counter overfitting by controlling parameter values or neuron activations during training. Striking the right balance in parameter count is crucial for building powerful neural networks that can effectively learn from data while avoiding the overfitting problem.