MLP & SVM Model Performance Compared

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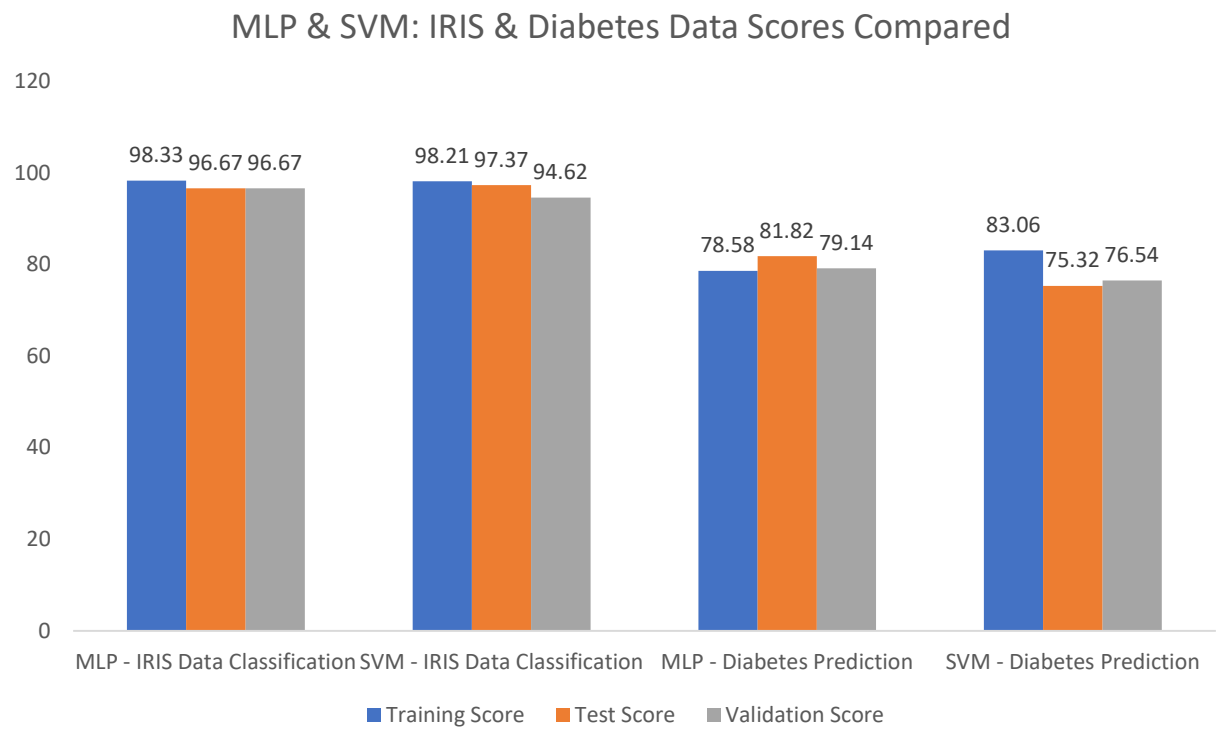
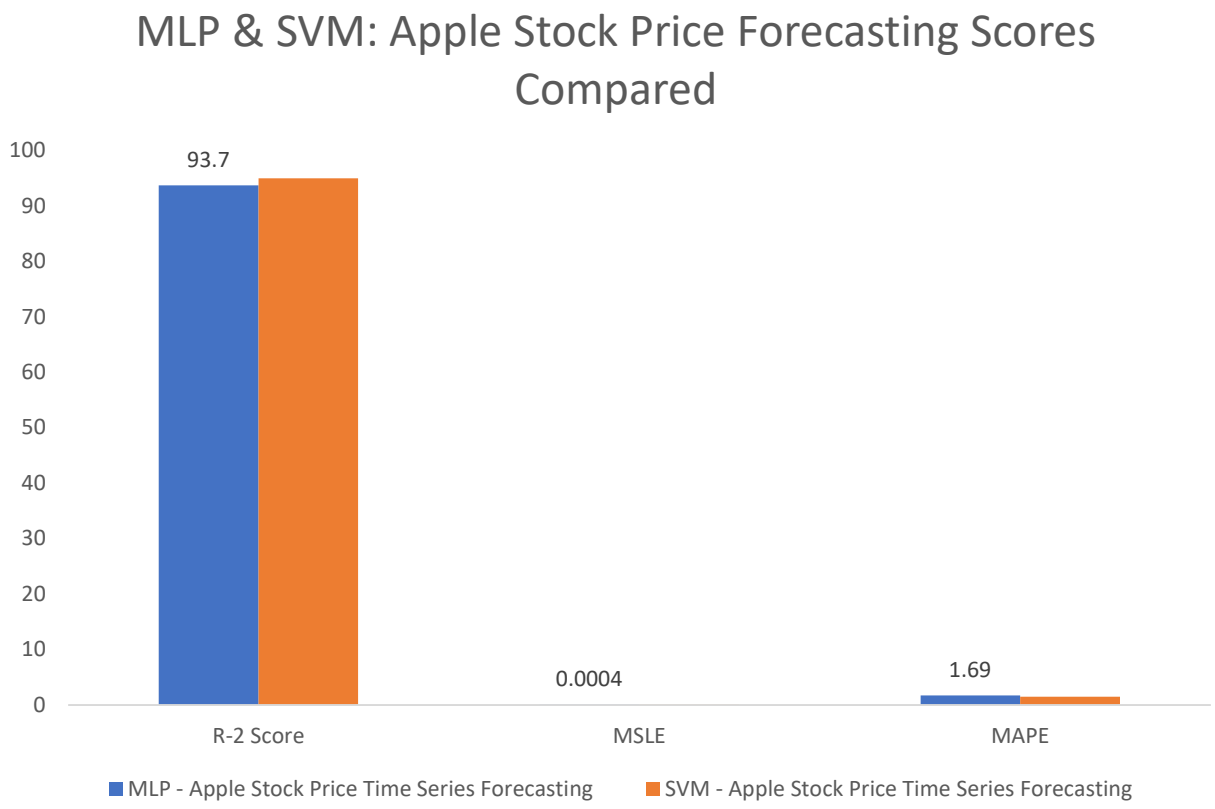
IE7860 – Winter 2022

After comparing models' output, it turned out that Training, Test, Validation Score, Accuracy, and R Squared (or r2) scores play a crucial role in evaluating the model performance. The goals were to build models with MLP and SVM to demonstrate the power of MLP and SVM Kernels in terms of classification, prediction, and time series forecasting. The observations-based models' performance is compared with tabular information and charts below.

Model	Training Score	Test Score	Validation Score
MLP - IRIS Data Classification	98.33	96.67	96.67
SVM - IRIS Data Classification	98.21	97.37	94.62
MLP - Diabetes Prediction	78.58	81.82	79.14
SVM - Diabetes Prediction	83.06	75.32	76.54



Model	R-2 Score	MSLE	MAPE
MLP - Apple Stock Price Time Series Forecasting	93.70	0.0004	1.69
SVM - Apple Stock Price Time Series Forecasting	94.98	0.0003	1.51



The numerical experiments performed for MLP and SVM networks have confirmed that both solutions are very well suited for classification, regression, and prediction tasks. However, in Regression, MLP possesses better generalization ability, while in Classification, SVM is unbeatable. It turns out most of the observed model performance differences are mostly negligible.

However, the main difference between MLP and SVM relies upon the networks' complexity. In general, MLP networks employ a global approximation strategy with minimal hidden neurons. In contrast, the SVM uses a local approximation strategy with many hidden units.

The SVM approach formulates a learning problem that leads to the quadratic optimization problem, and that help SVM reduces the number of operations in learning mode dramatically. That is why the SVM algorithm is usually much quicker for large datasets.