***Supervised Learning Model***

***Gaussian Naive Bayes***

**Strengths**

* **Less amout of data is required compared to other descriminative models like Logistic Regression**

**Weakness**

* **Data must be independent of one another ideally**
* **Simple representation without oppurtunities of hyperparameter tuning**
* **Not suitable for big datasets**

***Logistic Regression***

**Strengths**

* **Works well with correlated features**
* **There are many ways to regularize such a model so as to to avoid overfitting of data**
* **Unlike SVMs we can easily take in new data for training using online gradient descent**

**Weakness**

* **Requires much more data to achieve good accuracies**

***Support Vector Machines (SVMs)***

**Strengths**

* **Kernel Trick: Users can build in expert knowledge about the problem via engineering the kernel**
* **SVMs have regularization parameters to tolerate some errors and avoid over-fitting**
* **SVMs might be more robust even if the training samples have some bais**

**Weakness:**

* **High computational costs**
* **Users might need to have domain knowledge to use kernel functions**

***Decision Tree***

**Strengths**

* **Decision Trees implicitly perform variable screening or feature selection**
* **Decision Trees requires relatively little effort from users for data preperation**
* **Nonlinear relationships between parameters do not affect tree performance**

**Weakness**

* **Decision Trees are extremely sensitive to small pertubations in the training data. A slight change can result in a drastically different tree.**
* **They can easily overfit. Even though this can be prevented by validation methods and pruning ,but a lot of research still needs to done in this area**
* **If two features explain the same thing a decision tree only takes the best of those and neglects the other feature whie many other learning algorithms consider both of them. In such a way a decision tree might not be able to use all the available good features in a data**

***Ensemble Methods***

**Strengths**

* **Ensemble methods average out bais**
* **They help in reducing the variance**
* **They are unlikely to overfit**

**Weakness**

* **Difficult to learn correlation between classifiers from different types of learners**
* **Learning time and memory constraints might be high**
* **Learned concept might be difficult to understand**