

# Consistency of Machine-Learning Frameworks' Implementations: Report

Team: team 13

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Total Time Required (in hours): 15 hours

## Findings/Answer (200-300 words)

We compared the performance of the Linear Regression, Logistic Regression and Support Vector Machines across the skin not skin dataset and the NY Taxi data set. The three frameworks we used were Scikit learn, Tensorflow and mlExtend. Not all of these were implemented in the frameworks chosen. For example, mlExtend did not implement SVM and Tensorflow required manual implementation of all none neural network algorithm. On the "skin not skin" dataset the performance of the same algorithm on the same datasets was relatively similar with accuracy generally being above .5 and remaining consistent between 70/30 and cross validation.

On the taxis dataset there was widely different performance of the linear regression algorithm. The scikit learn out performed both tensorflow and mlExtend in the 70/30 split, but vastly underperformed when using cross validation. Tensorflow's linear regression saw a slight improvement in performance between 70/30 and cross validation. While mlExtend also saw a decrease in RMSE it was a smaller improvement and was the most consistent algorithm across the two metrics.

Both scikit-learn and mlExtend performed well on the taxi data where we separated the journeys into short or long and remained accurate and consistent across the two frameworks and in both 70/30 and Cross Validation

## Data, Algorithms, etc.

<b>Framework 1</b>	scikit-learn
<b>Framework 2</b>	Tensorflow
<b>Framework 3</b>	MLXtend
<b>Algorithm 1</b>	Linear Regression
<b>Algorithm 2</b>	Logistic Regression
<b>Algorithm 3</b>	Support Vector Machine Classification
<b>Dataset 1</b>	NY Taxis
<b>Dataset 2</b>	Skin not Skin
<b>Metric 1</b>	Accuracy
<b>Metric 2</b>	Mean Square Error
<b>Split Method 1</b>	70/30
<b>Split Method 2</b>	10-fold

## Contributions (max. 200 words)

Gordon Hind (14311128): Tensorflow algorithms, report

Brian De Buiteach (14314613): mlExtend algorithms

Aodan O Laoghaire (14311771): Scikit-Learn algorithms