Capstone 2 - Model Metrics
Kirsten Regier

1 Decision Tree Model
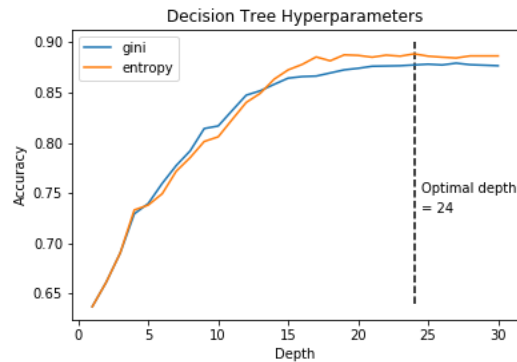
1.1 Hyperparameters

Figure 1: Grid search results for **depth** and **node purity** method hyperparameters.

1.2 Model parameters

DecisionTreeClassifier(ccp_alpha=0.0, class_weight=None, criterion='entropy', max_depth=24, max_features=None, max_leaf_nodes=None, min_impurity_decrease=0.0, min_impurity_split=None, min_samples_leaf=1, min_samples_split=2, min_weight_fraction_leaf=0.0, presort='deprecated', random_state=21, splitter='best')
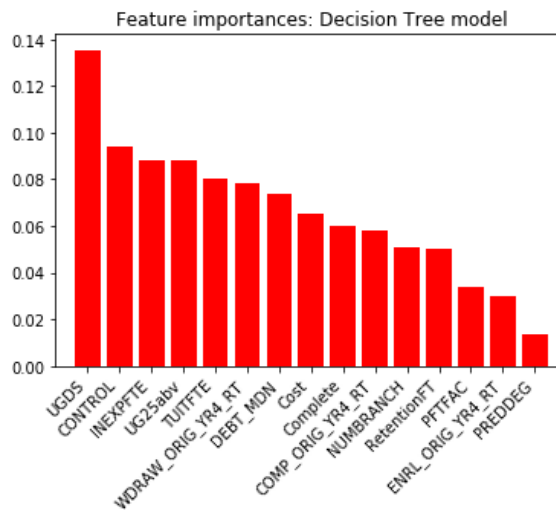

Figure 2: Feature importance levels based on the Decision Tree model.

1.3 Model evaluation

Table 1: Decision Tree - Confusion matrix and Evaluation metrics

Currently operating		Predicted		Recall
		No	Yes	
Actual	No	1525	131	0.92
	Yes	302	1930	.86
Precision		.83	.94	
Accuracy				.889

2 AdaBoost Model
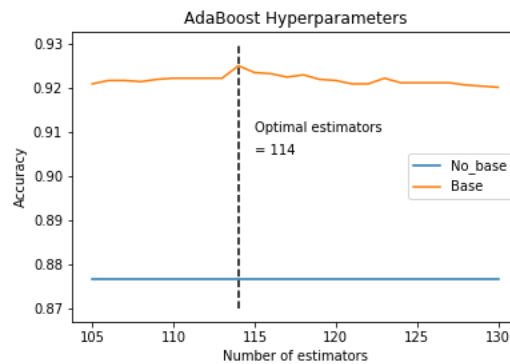
2.1 Hyperparameters

Figure 3: Grid search results for **number of estimators** hyperparameter.

2.2 Model parameters

AdaBoostClassifier(algorithm='SAMME.R', base_estimator=DecisionTreeClassifier(ccp_alpha=0.0, class_weight=None, criterion='entropy', max_depth=24, max_features=None, max_leaf_nodes=None, min_impurity_decrease=0.0, min_impurity_split=None, min_samples_leaf=1, min_samples_split=2, min_weight_fraction_leaf=0.0, presort='deprecated', random_state=21, splitter='best'), learning_rate=1.0, n_estimators=114, random_state=21)
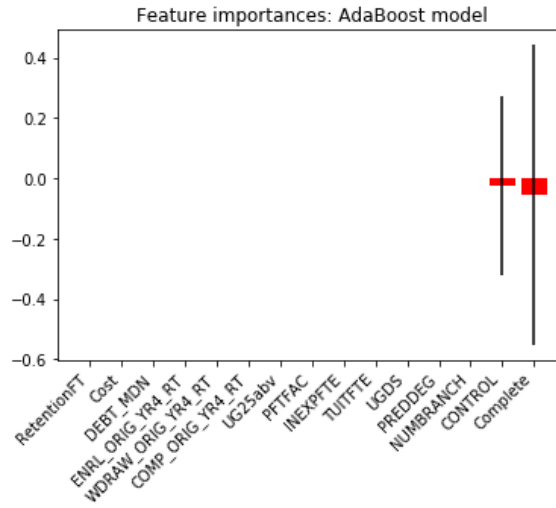
2.3 Model evaluation

Figure 4: Feature importance levels based on the AdaBoost model.

Table 2: AdaBoost Model - Confusion matrix and Evaluation metrics

Currently operating		Predicted		Recall
		No	Yes	
Actual	No	1536	120	0.93
	Yes	171	2061	.92
Precision		.90	.94	
Accuracy				.93

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