Report

your name

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1 Part 1: Decision Tree

1.1 Information Gain

Test results and referring to the tree diagram.

1.2 Average Gini Index

Test results and referring to the tree diagram.

1.3 Information Gain with Chi-squared Pre-pruning

Test results and referring to the tree diagram.

1.4 Average Gini Index with Chi-squared Pre-pruning

Test results and referring to the tree diagram.

2 Part 2: Support Vector Machine

2.1 First Part

Draw the resulting classifiers together with data points using draw_svm function in draw.py and comment on how changing C affects the behavior of the classifier.

2.2 Second Part

Draw the resulting classifiers together with data points using draw_svm function in draw.py and comment on how changing kernels affects the behavior of the classifier.

2.3 Third Part

The tables below have the example hyperparameters. Feel free the change them. Report the hyperparameters of your best model and its test accuracy.

gamma	C				
	0.01	0.1	1	10	100
-	val	val	val	val	val

Table 1: Linear kernel

gamma	C				
	0.01	0.1	1	10	100
0.00001	val	val	val	val	val
0.0001	val	val	val	val	val
0.001	val	val	val	val	val
0.01	val	val	val	val	val
0.1	val	val	val	val	val
1	val	val	val	val	val

Table 2: RBF kernel

2.4 Fourth part

2.4.1 Without handling the imbalance problem

Report test accuracy. Can accuracy be a good performance metric? Report confusion matrix and comment on it. Report additional metrics here if you want.

2.4.2 Oversampling the minority class

Report your test accuracy, confusion matrix and comment on them.

2.4.3 Undersampling the majority class

Report your test accuracy, confusion matrix and comment on them.

2.4.4 Setting the class_weight to balanced

Report your test accuracy, confusion matrix and comment on them.

gamma	C				
	0.01	0.1	1	10	100
0.00001	val	val	val	val	val
0.0001	val	val	val	val	val
0.001	val	val	val	val	val
0.01	val	val	val	val	val
0.1	val	val	val	val	val
1	val	val	val	val	val

Table 3: Polynomial kernel

gamma	C				
	0.01	0.1	1	10	100
0.00001	val	val	val	val	val
0.0001	val	val	val	val	val
0.001	val	val	val	val	val
0.01	val	val	val	val	val
0.1	val	val	val	val	val
1	val	val	val	val	val

Table 4: Sigmoid kernel