Impurity Metric	Max Depth	Precision	Recall	F1 Score
Gini Index	2	.758	.965	.849
	3	.780	.950	.857
	4	.802	.965	.876
	5	.821	.989	.893
Entropy	2	.758	.965	.849
	3	.772	.960	.856
	4	.794	.960	.869
	5	.8	.975	.879

Table 1 – Model performance metrics for "no-recurrence-events" class

Impurity Metric	Max Depth	Precision	Recall	F1 Score
Gini Index	2	.767	.271	.4
	3	.756	.365	.492
	4	.841	.435	.574
	5	.913	.494	.641
Entropy	2	.767	.271	.4
	3	.778	.329	.463
	4	.814	.412	.547
	5	.878	.424	.571

Table 2 – Model performance metrics for "recurrence-events" class

Question 1 (1 point): Based upon the model performance metrics, which class value is DecisionTreeClassifier **"better"** at predicting? Be sure to specifically mention the metric(s) you're using to quantify your findings.

Based upon the model performance metrics, DecisionTreeClassifier is better at predicting no-recurrence-events occurrences. Although the "recurrence-events" class consistently has a higher precision at every max depth, the recall and F1 scores are significantly lower than those from no-recurrence-events. Meanwhile, the no-recurrence-events class has consistently high precision, recall, and F1 scores, indicating that it is better at predicting instances of that class.

Question 2 (1 point): Which impurity metric provides higher quality predictions? Be sure to specifically mention the metric(s) you're using to quantify your findings.

Gini index tends to produce higher quality predictions. For each of precision, recall, and F1 score, Gini index consistently produces higher in each of those metrics in each max depth greater than 2.

Question 3 (1 point): Regardless of the impurity metric, what happens as max depth increases? Be sure to specifically mention the metric(s) you're using to quantify your findings.

Within the perform tests, as max depth increases, precision, recall, and F1 score tend to increase regardless of impurity metric.

Question 4 (1 point): Try incrementally increasing the max depth value up to 20 for each of the impurity metrics. What happens to the performance metrics when you do this? Why is this trend actually problematic for the model? Be sure to specifically name the phenomenon that is occurring as the max depth is increased.

As max depth trends towards 20, each of the performance metrics appears to further increase towards 1. This trend is problematic because it resembles overfitting, meaning that the model is paying too much attention to training data and thus will struggle to generalize on data it has not yet seen.