# Credit Risk Modeling

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**Business Objective**

Can Predictive Analytics modeling techniques identify companies who will default on their credit loan?

## Modeling and Evaluating



**Modeling:**
This is the output data that is the most accurate at 93.59% : +/-4.17%

○ Table View  ○ Plot View

accuracy: 93.59% +/- 4.17% (mikro: 93.59%)

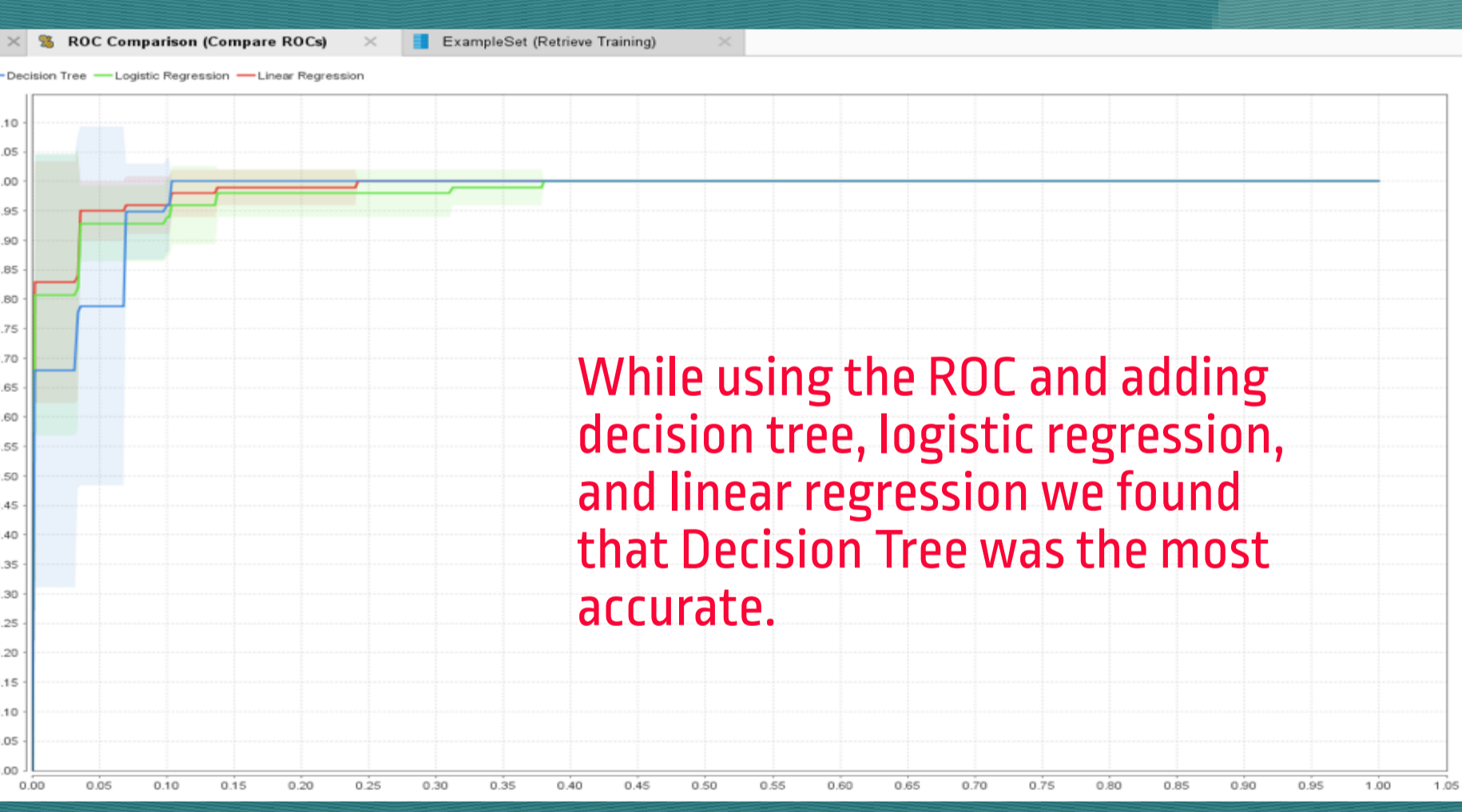|  | true No | true Yes | class precision |
|---|---|---|---|
| pred. No | 282 | 14 | 95.27% |
| pred. Yes | 11 | 83 | 88.30% |
| class recall | 96.25% | 85.57% | |

1. Precision:
   a. Predicted True Yes = 296 patients to have a second heart attack where the actual number were 282 patients (True YES = True Positive) --> Yes Class Precision of True is Positive is 282/296 (95.27%)
   b. Predicted True No = 94 patients to have a second heart attack where the actual number were 83 patients --> Precision of True is Negative is 83/94 (88.30%)
2. Recall:
   a. Only 282 out of 293 were able to find --> Class Recall for True Yes is 82/293 (96.25%)
   b. Only 83 out of 97 were able to find --> Class Recall for True No is 73/97 (85.57%)
   Expense to Revenue Ratio is correlated at 0.816.

While using the ROC and adding decision tree, logistic regression, and linear regression we found that Decision Tree was the most accurate.

Within the data above in the second row let's theoretically say that the company spent $570,000 and only gained $100,000 and they will be automatically defaulted. However going to row 15, let's say they had $1,125,000 in expenses and had 1,250,000 in revenue, the company is making money and they will not be defaulted.

As you can see as soon as a company's expense to revenue ratio is above a 1.0 they will default. The expense to revenue ratio is the money you spend vs the money that comes in. Within the data above in the second row let's theoretically say that the company spent $570,000 and only gained $100,000 and they will be automatically defaulted. However going to row 15, let's say they had $1,125,000 in expenses and had 1,250,000 in revenue, the company is making money and they will not be defaulted. In order to not be defaulted by a credit company you need to make more than you spend.

## Deployment & Summary

How can a credit company use this? By taking data on the that uses the 20 original data attributes, making Expense to Revenue Ratio the strongest attribute, companies can then see and actively predict if a company will default their credit loan. This is huge when looking into the future of the credit companies and who can make money.

When looking at the data, there are different attributes in determining if a company will default on their credit loan or not. The attribute that is most closely related to a default is Expense to Revenue Ratio.