Model Assessment

Outline of Model Assessment

- Overview of summary statistics for assessing model performance

- Recap of assessment plots

- Demo of model comparison node

Summary Statistics Overview

Prediction Type	Statistic
Decisions	**Accuracy/Misclassification** **Profit/Loss** **Inverse prior threshold**
Rankings	ROC Index (concordance) Gini coefficient
Estimates	Average squared error SBC/Likelihood

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Summary Statistics Overview
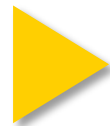
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Summary Statistics Overview

Prediction Type	Statistic
▶ **Decisions**	**Accuracy/Misclassification** Profit/Loss Inverse prior threshold
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Using Assessment Statistics

Prediction Type	Validation Fit Statistic	Direction
Decisions	Misclassification	smallest
	Average Profit/Loss	largest/smallest
	Kolmogorov-Smirnov Statistic	largest
Rankings	ROC Index (concordance)	largest
	Gini Coefficient	largest
Estimates	Average Squared Error	smallest
	Schwarz's Bayesian Criterion	smallest
	Log-Likelihood	largest
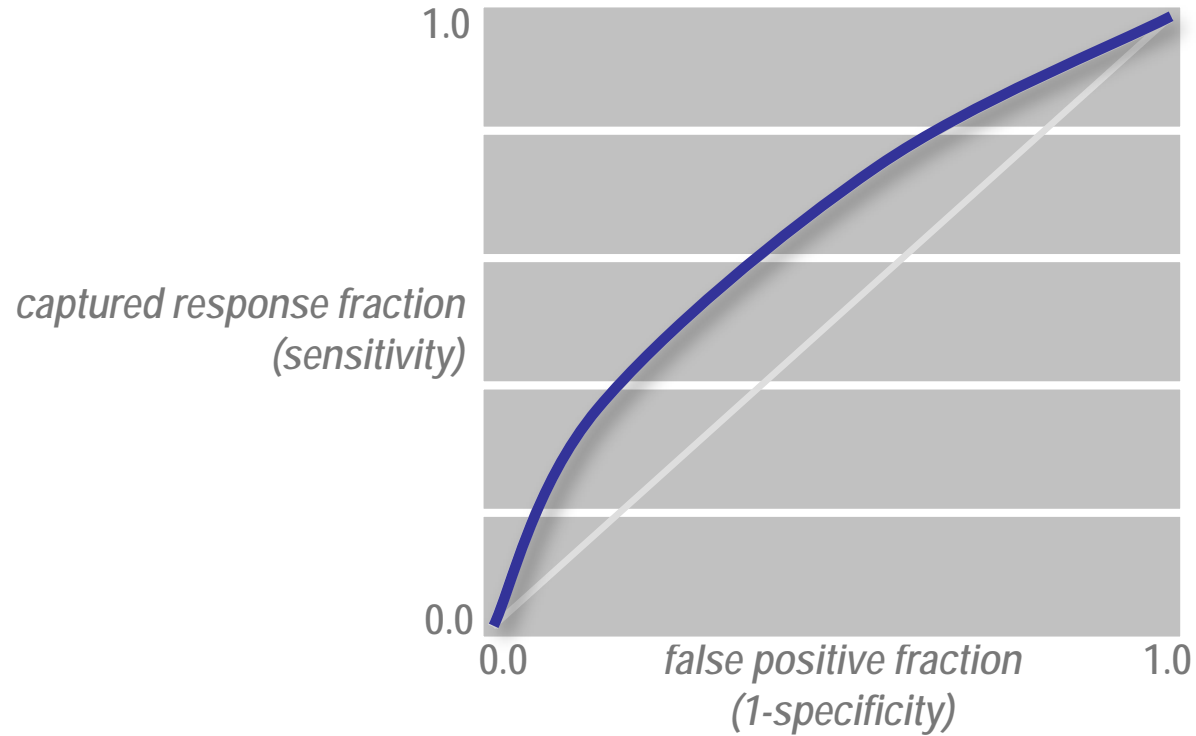
Statistical Graphics – ROC Chart

The ROC chart illustrates a tradeoff between a captured response fraction and a false positive fraction.
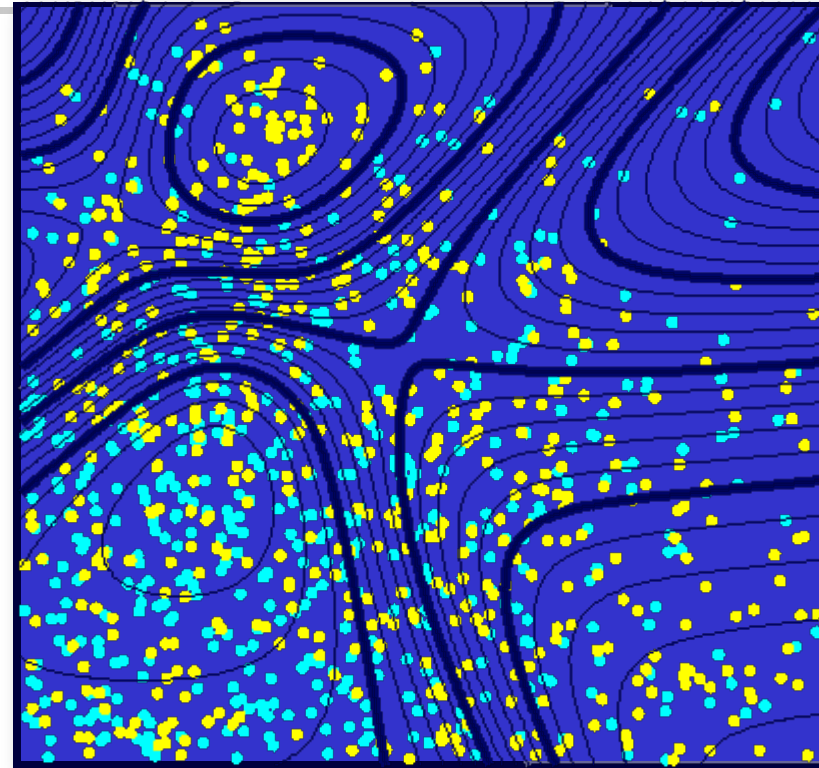
Statistical Graphics – ROC Chart

captured response fraction (sensitivity) — vertical axis, 0.0 to 1.0

false positive fraction (1-specificity) — horizontal axis, 0.0 to 1.0

The ROC chart illustrates a tradeoff
between a captured response
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and a false positive fraction.

Statistical Graphics – ROC Chart

Each point on the ROC chart corresponds to a specific fraction of cases, ordered by their predicted value.

Statistical Graphics – ROC Chart

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Statistical Graphics – ROC Chart

top 40%

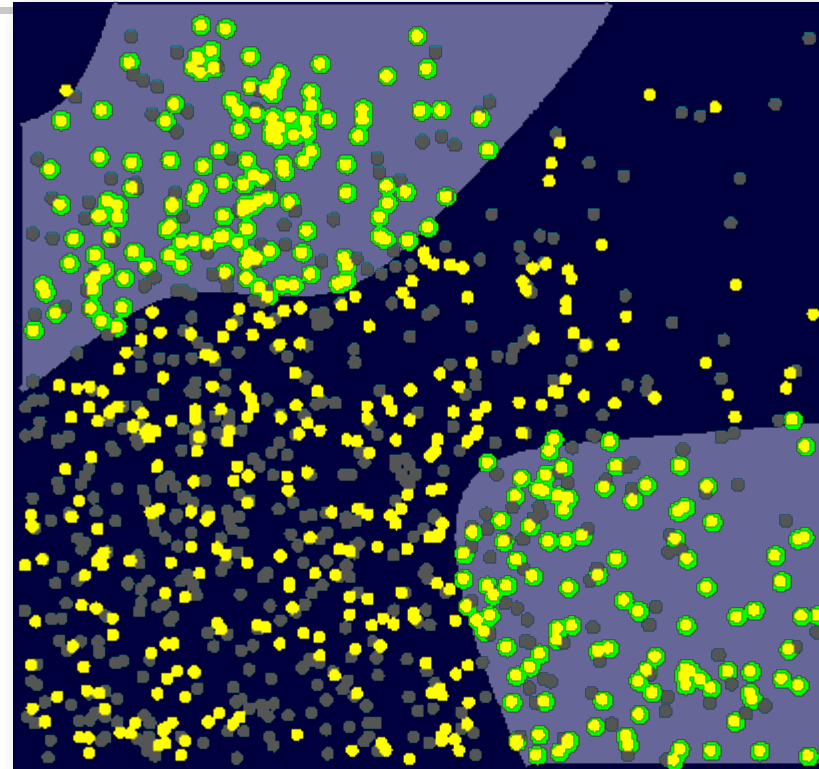For example, this point on the ROC chart corresponds to the 40% of cases with the highest predicted values.
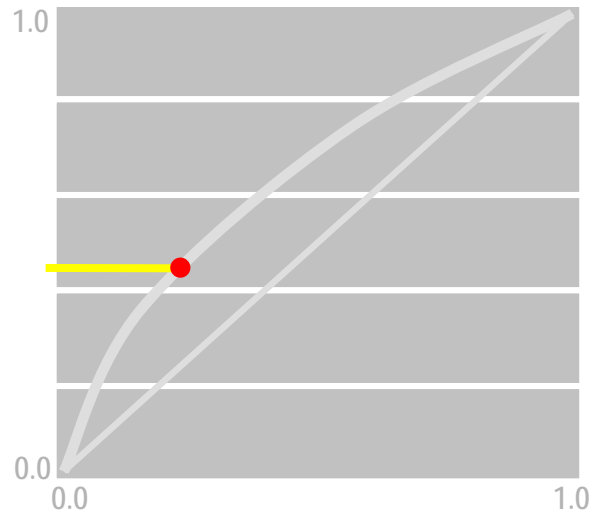
Statistical Graphics – ROC Chart

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Statistical Graphics – ROC Chart

top 40%

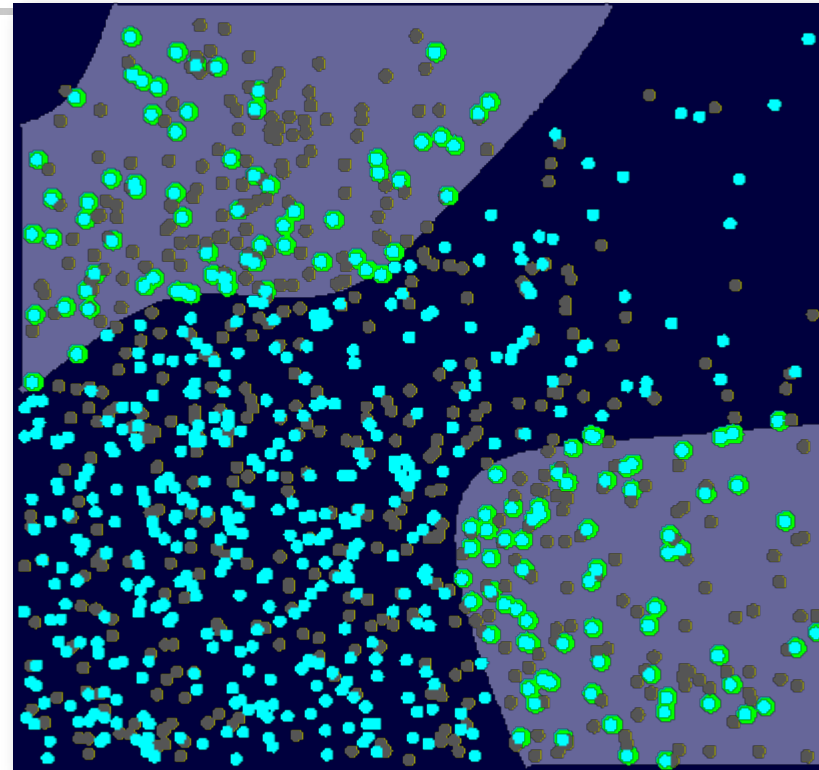The *y*-coordinate shows the fraction of primary outcome cases captured in the top 40% of all cases.
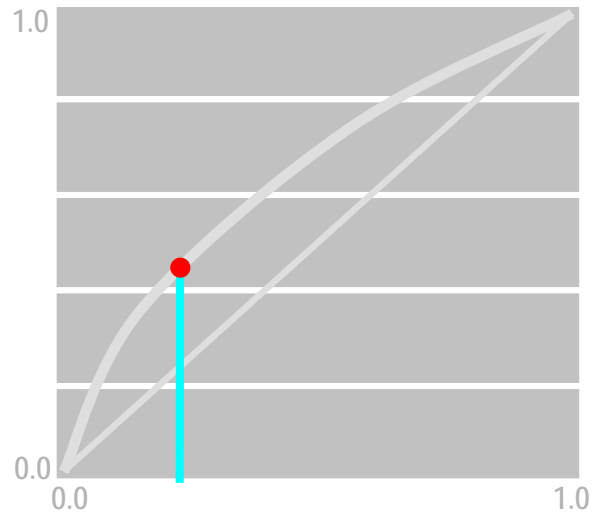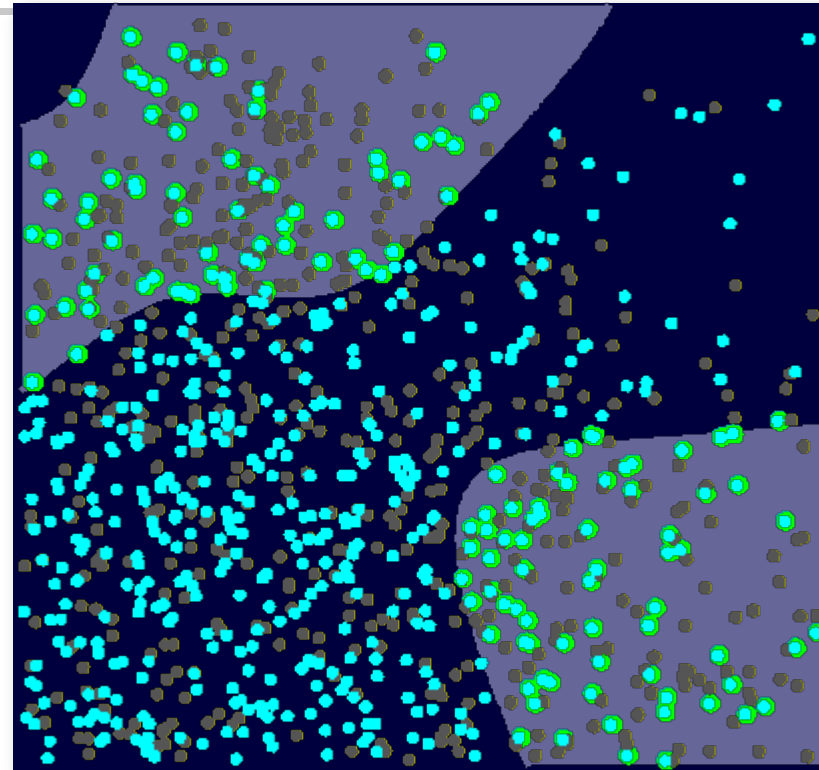
Statistical Graphics – ROC Chart

top 40%

The *y*-coordinate shows the fraction of *primary* outcome cases captured in the top 40% of all cases.
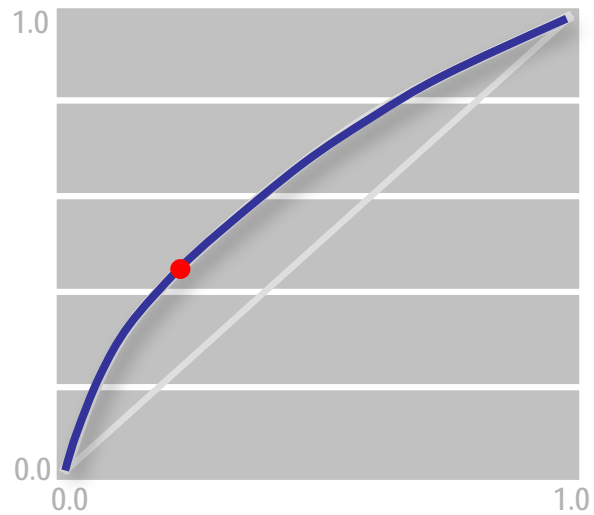
Statistical Graphics – ROC Chart

top 40%

The *x*-coordinate shows the fraction of *secondary* outcome cases captured in the top 40% of all cases.
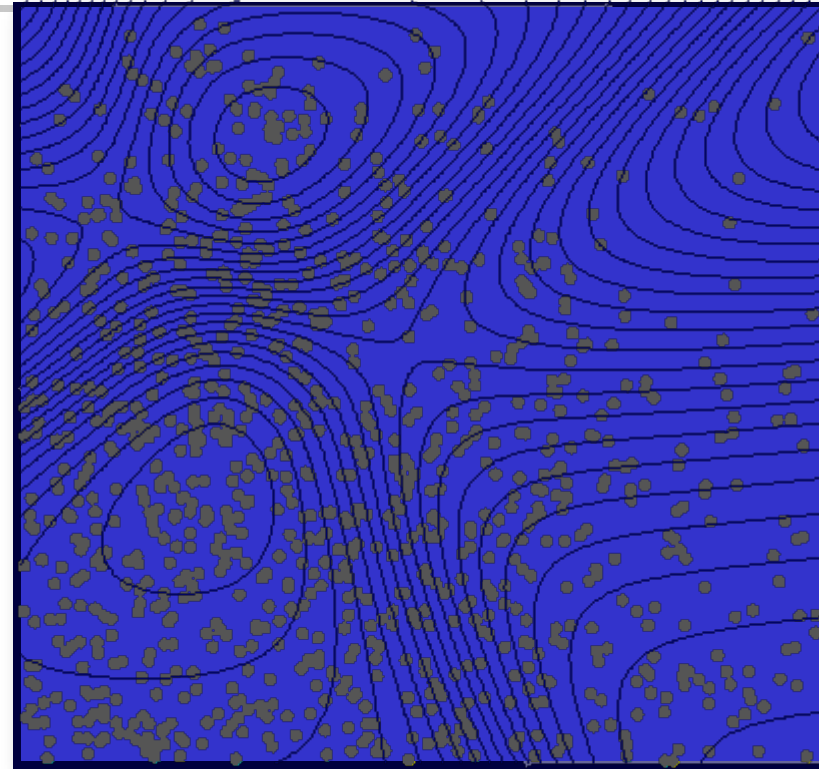
Statistical Graphics – ROC Chart

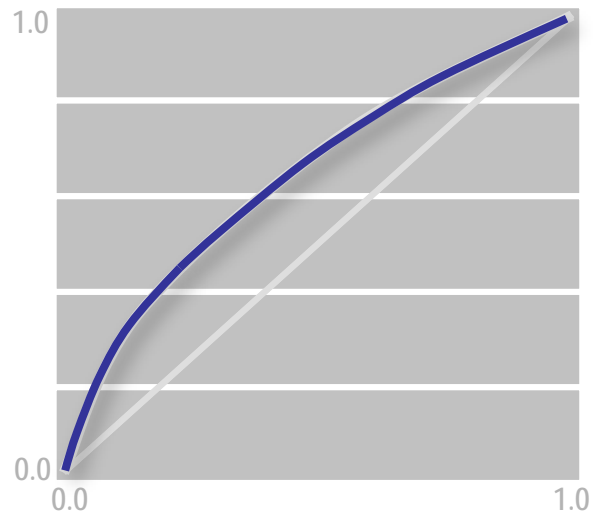*top 40%*

The *x*-coordinate shows the fraction of *secondary* outcome cases captured in the top 40% of all cases.

Statistical Graphics – ROC Chart
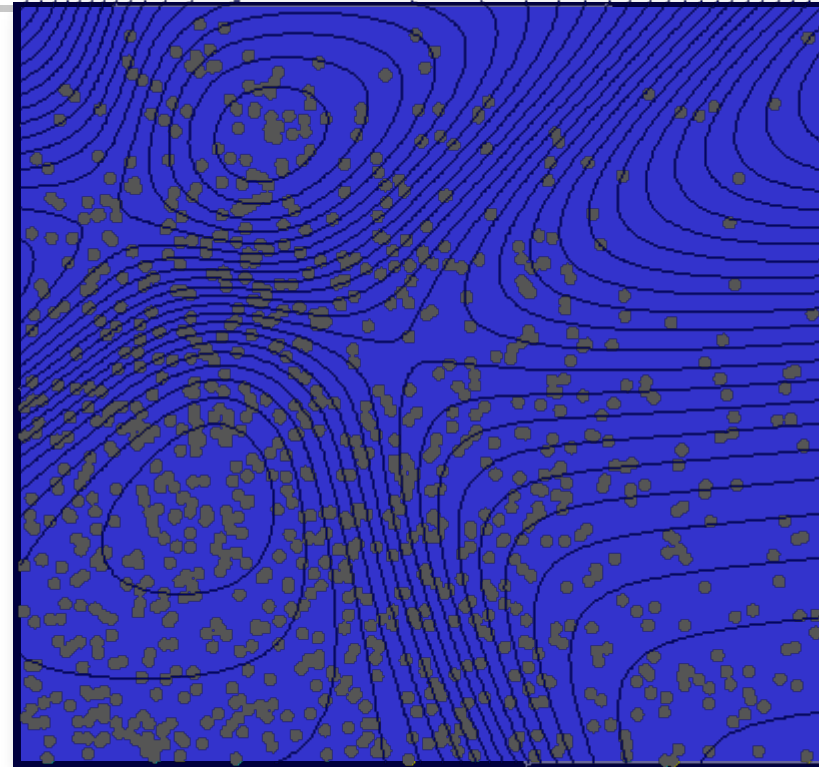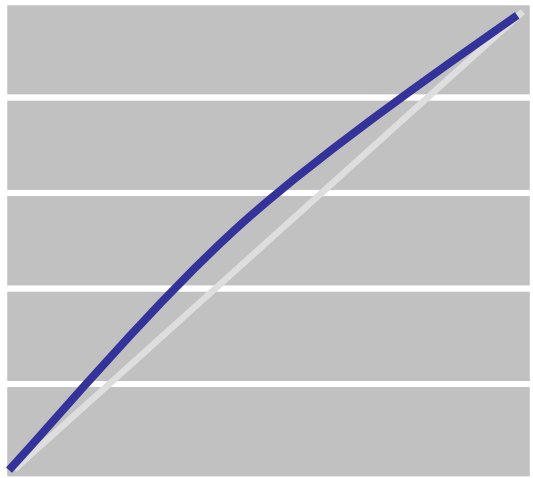

top 40%

Repeat for all selection fractions.

Statistical Graphics – ROC Chart
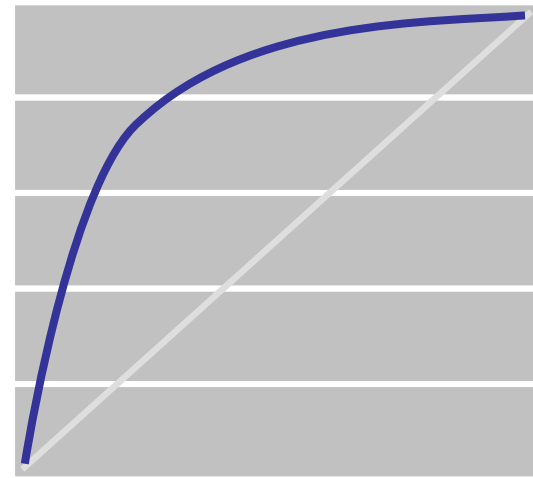

1.0

0.0

0.0 1.0
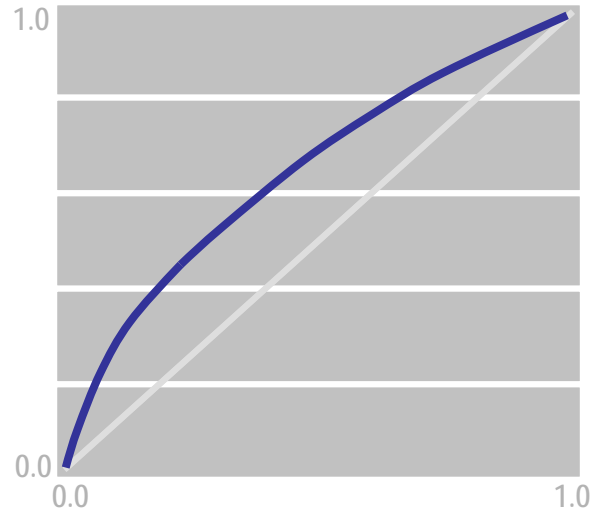
Repeat for all selection fractions.

top 40%

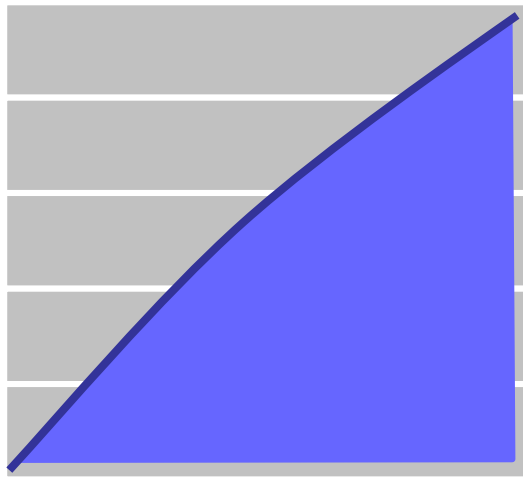...

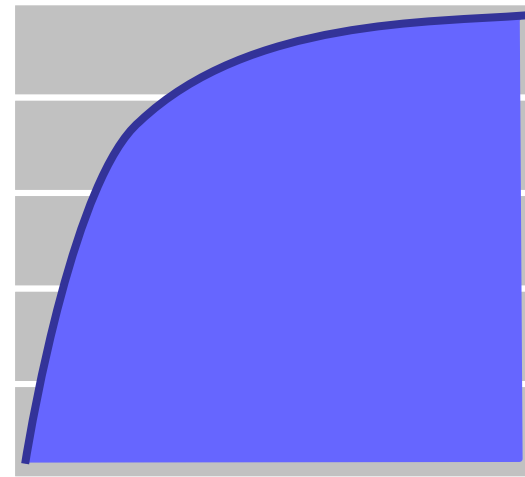# Statistical Graphics – ROC Chart

weak model
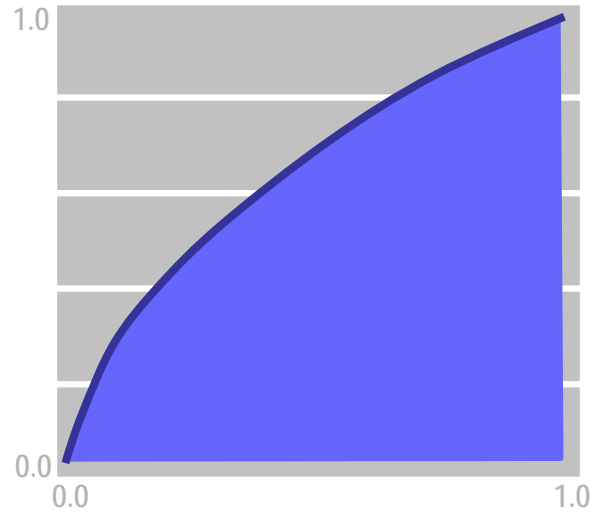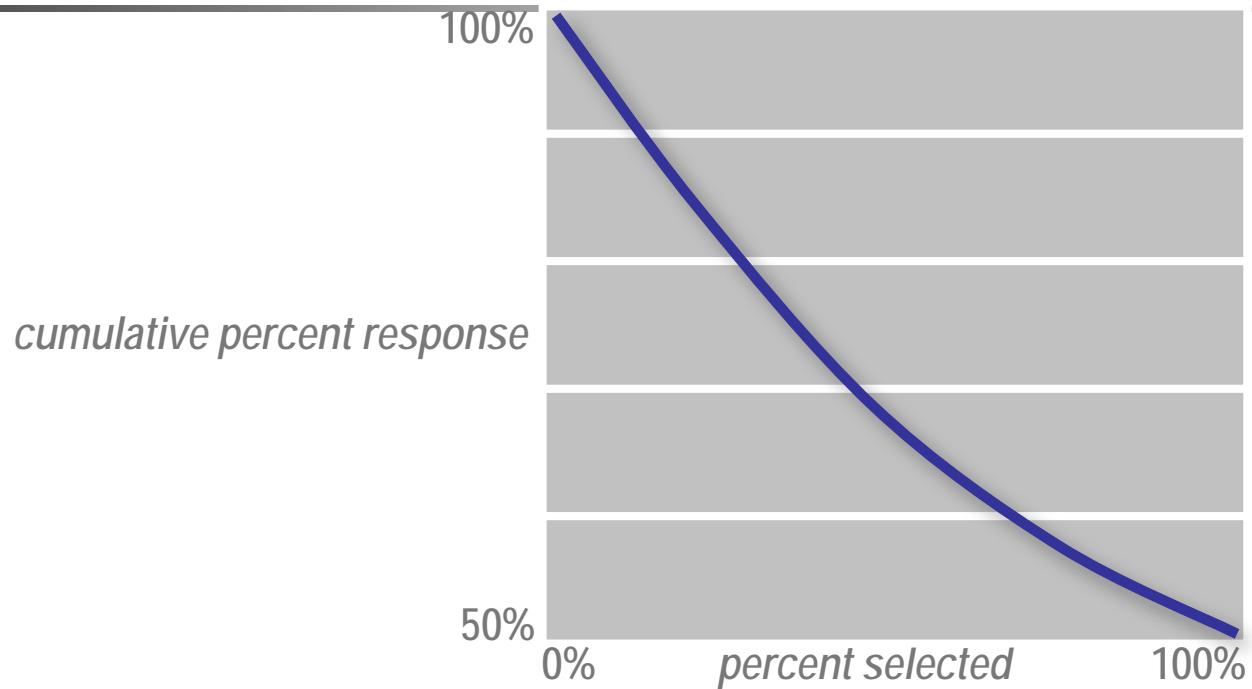
strong model

...

Statistical Graphics – ROC Index

weak model
ROC Index < 0.6
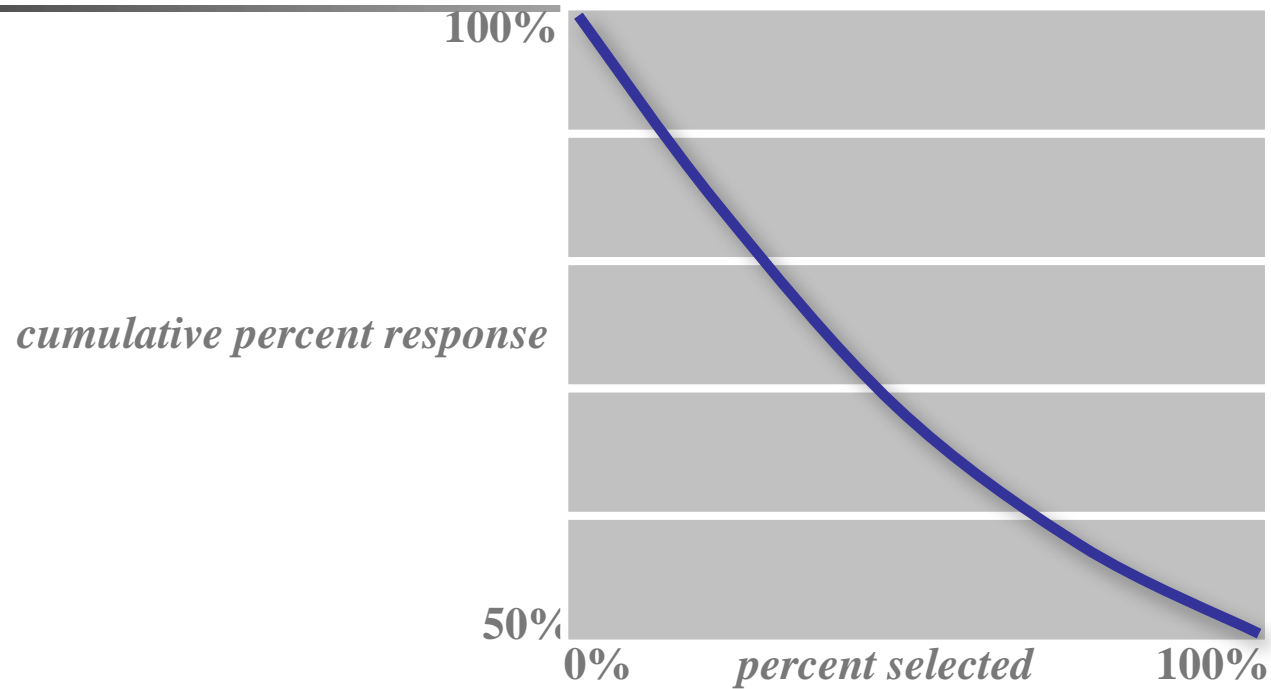
strong model
ROC Index > 0.7

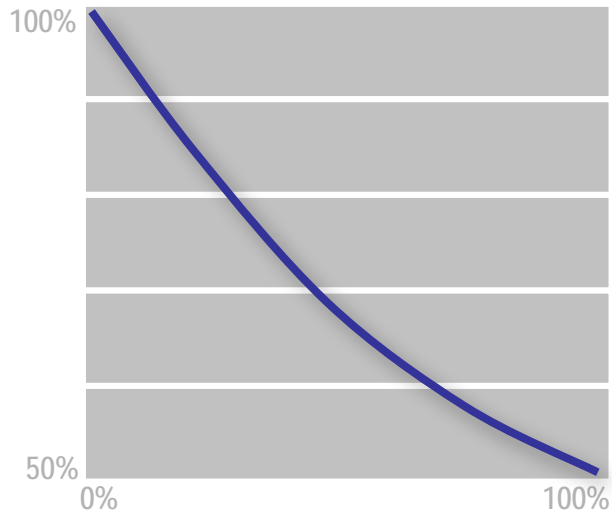# Statistical Graphics – Response Chart

The response chart shows the expected
response rate for various selection percentages.

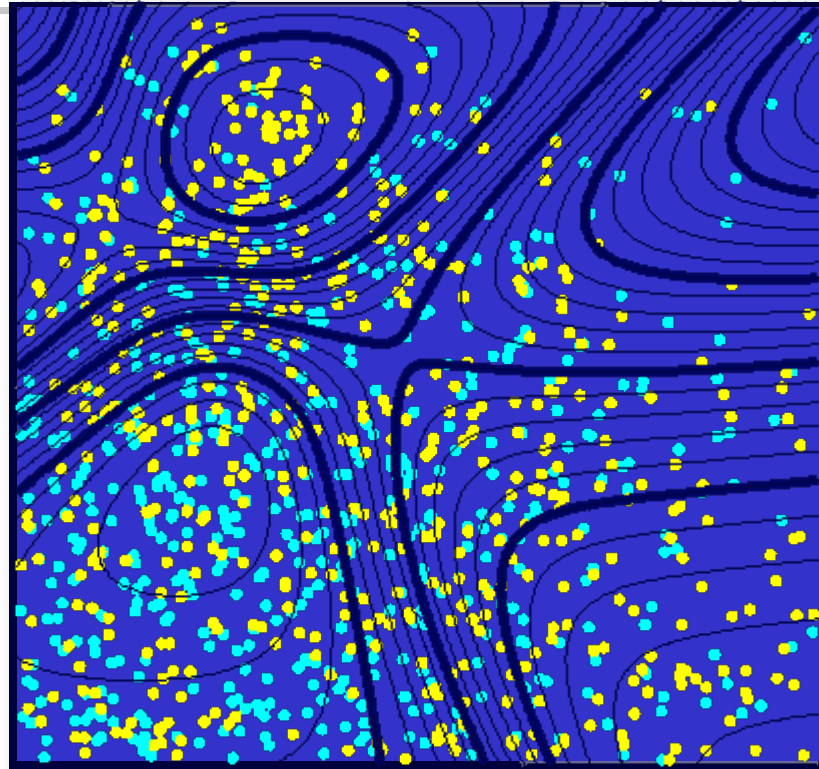# Statistical Graphics – Response Chart

The response chart shows the expected
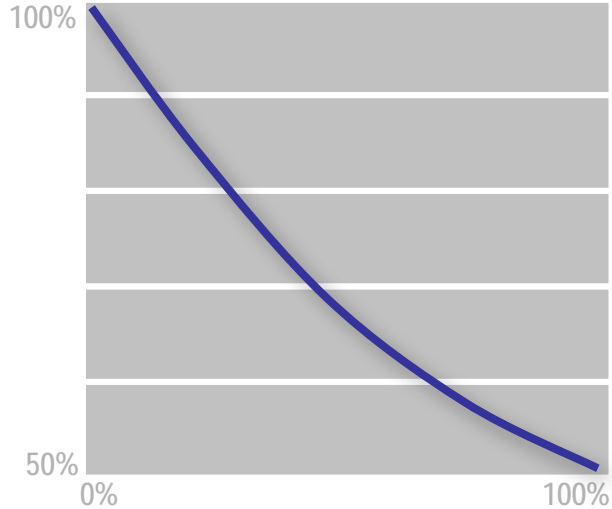response rate for various selection percentages.
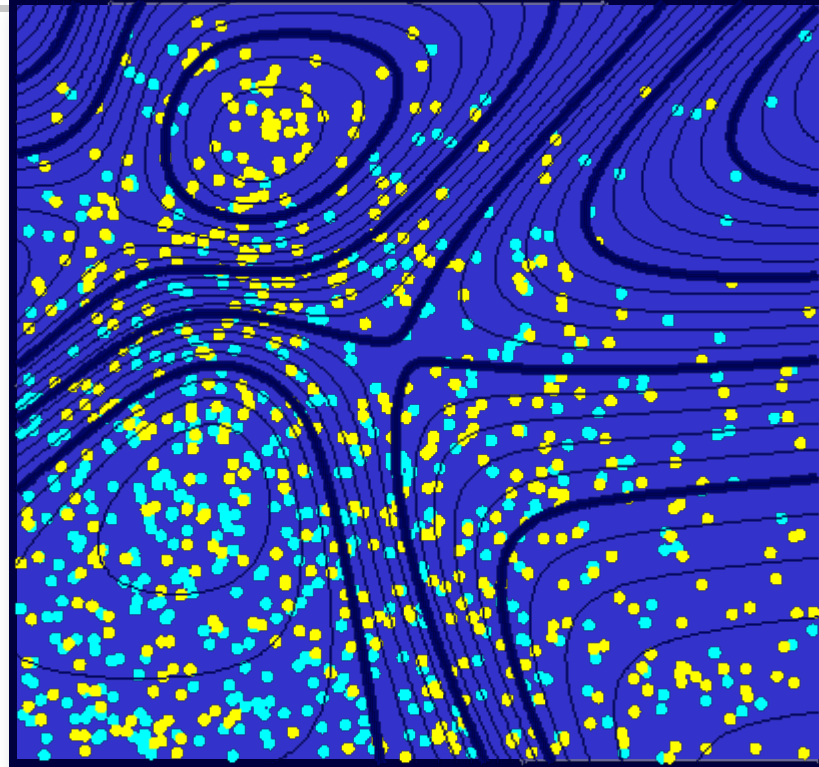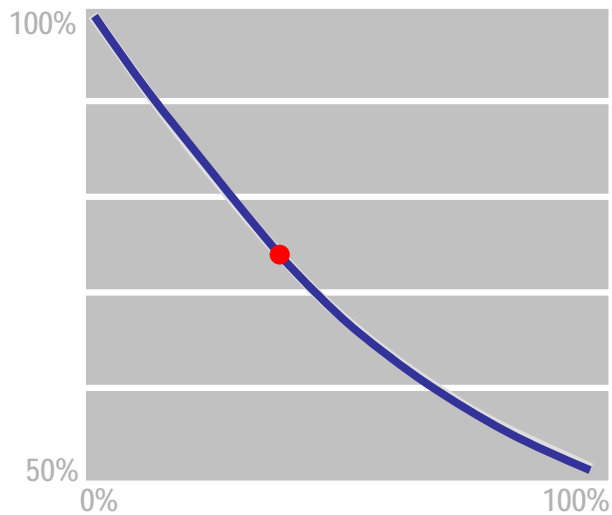
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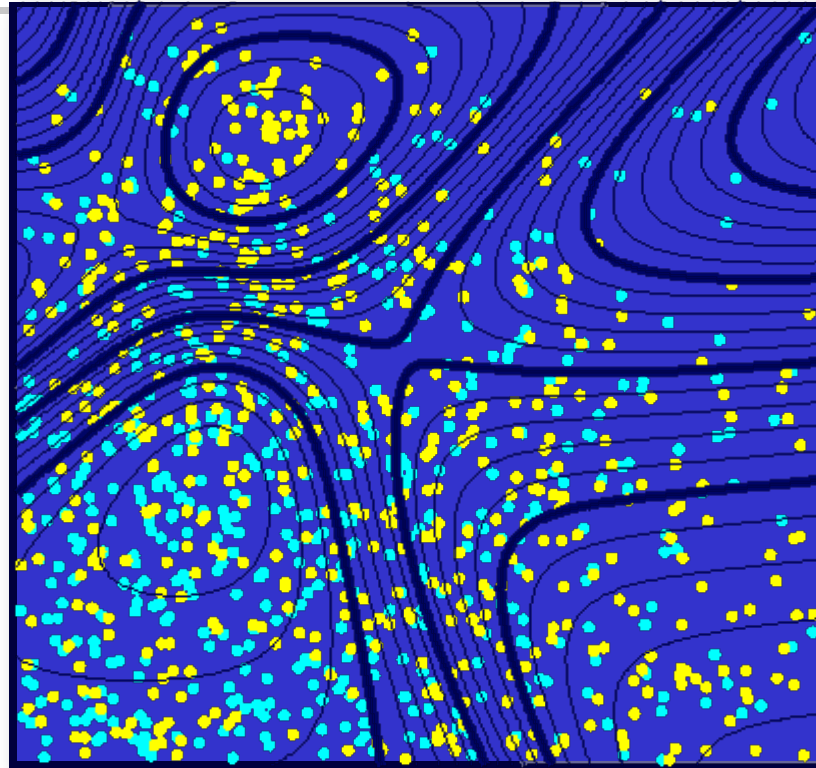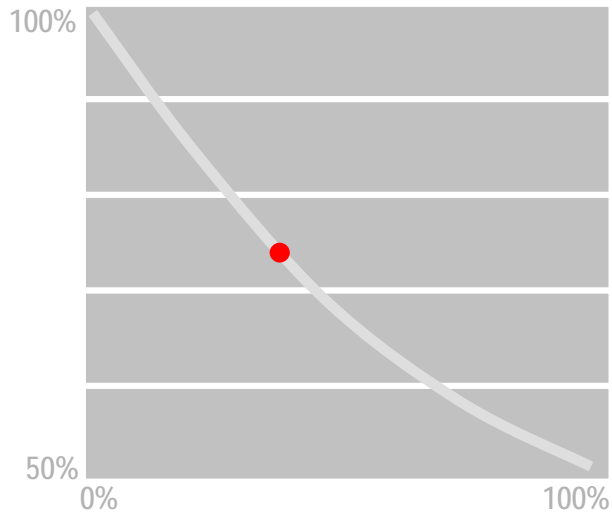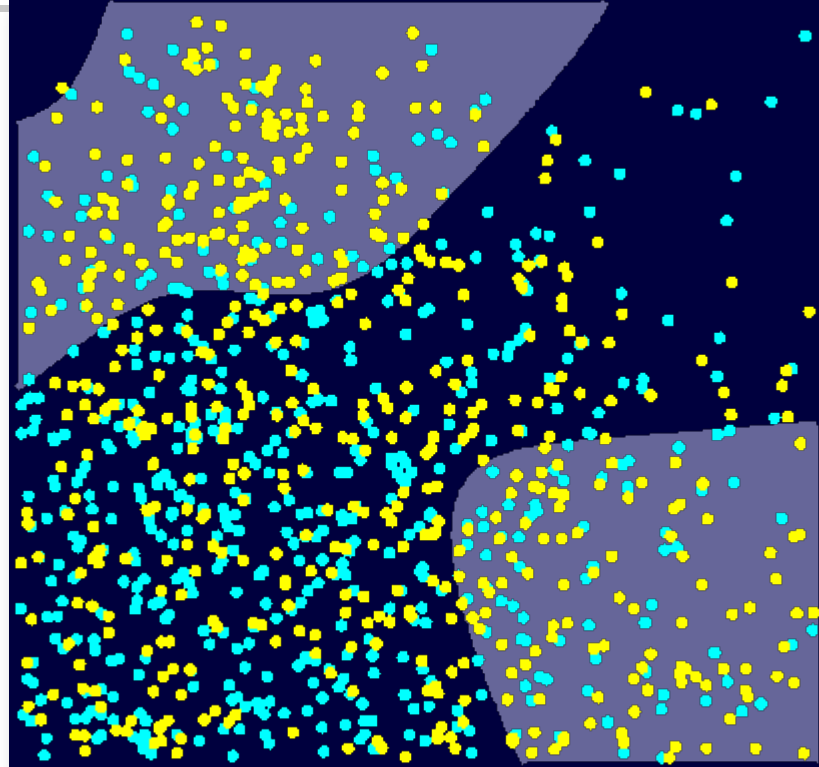

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Statistical Graphics – Response Chart

For example, this point on the response chart corresponds to the 40% of cases with the highest predicted values.

Statistical Graphics – Response Chart

top 40%
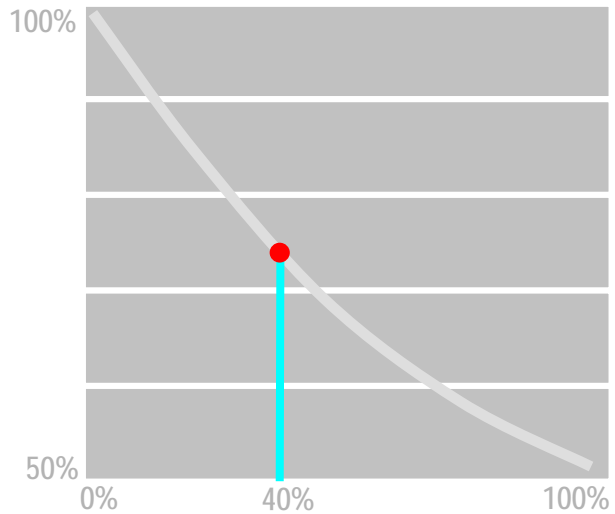
For example, this point on the response chart corresponds to the 40% of cases with the highest predicted values.
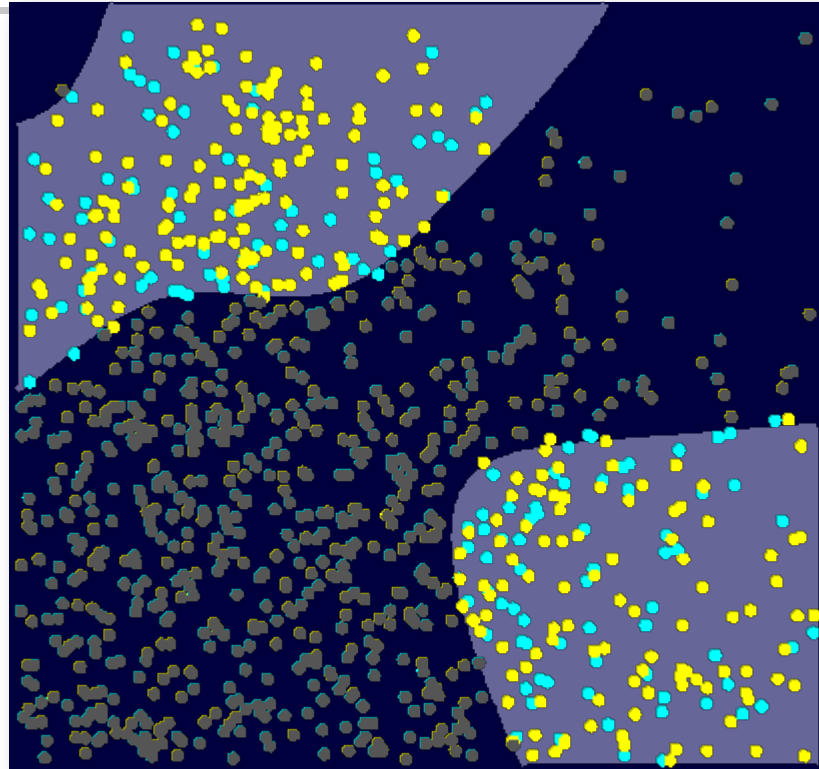
Statistical Graphics – Response Chart

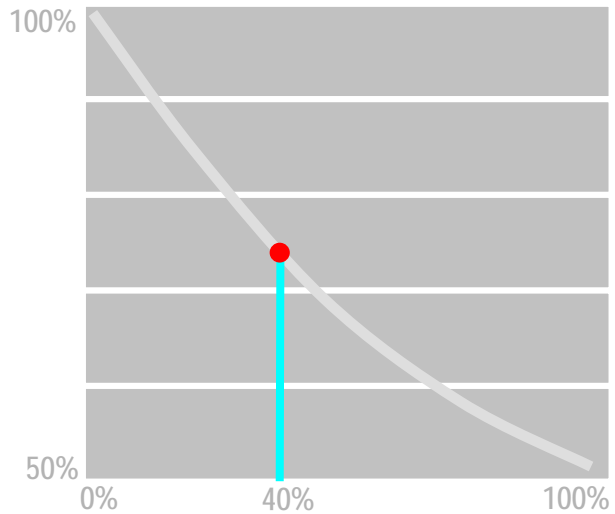100%

50%

0%   40%   100%

top 40%

The *x*-coordinate shows the percentage of selected cases.

Statistical Graphics – Response Chart

100%

50%

0%   40%   100%

The *x*-coordinate shows the
percentage of selected cases.

top 40%
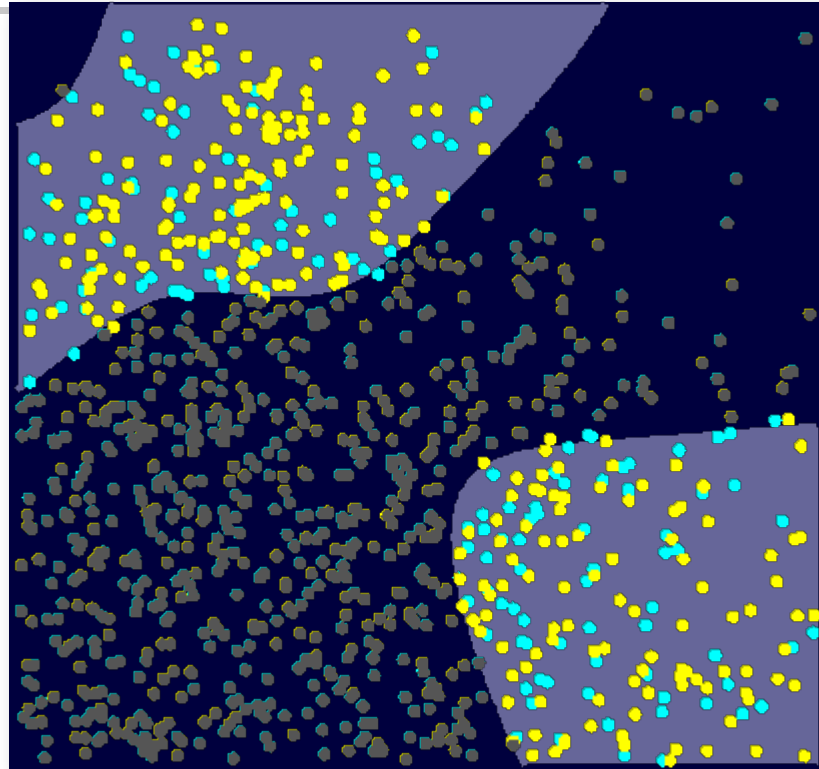
Statistical Graphics – Response Chart
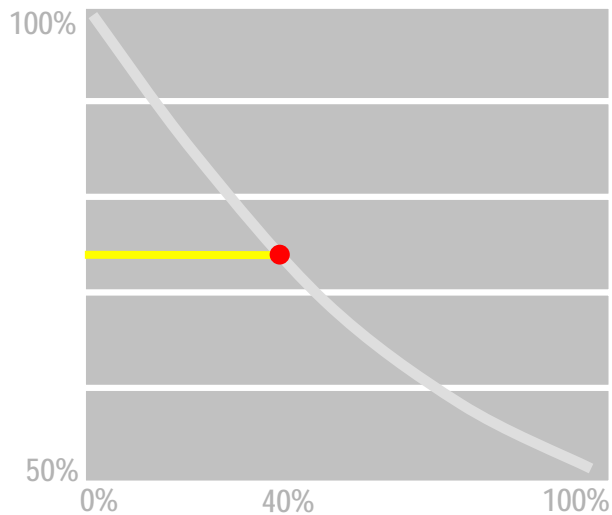
100%

50%

0%   40%   100%

top 40%

The *y*-coordinate shows the percentage of primary outcome cases found in the top 40%.

Statistical Graphics – Response Chart

100%

50%

0% 40% 100%

top 40%

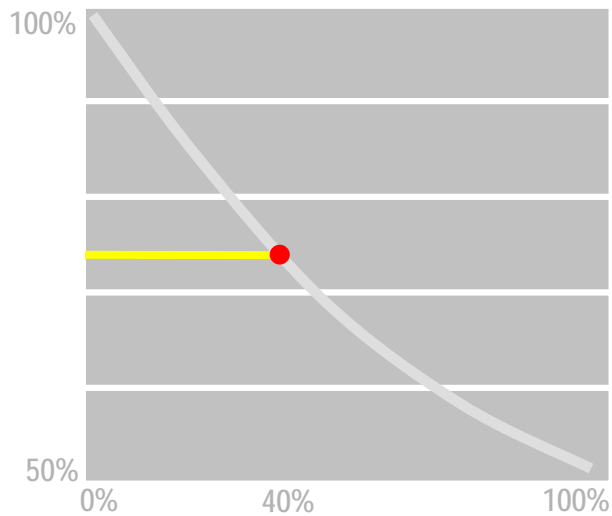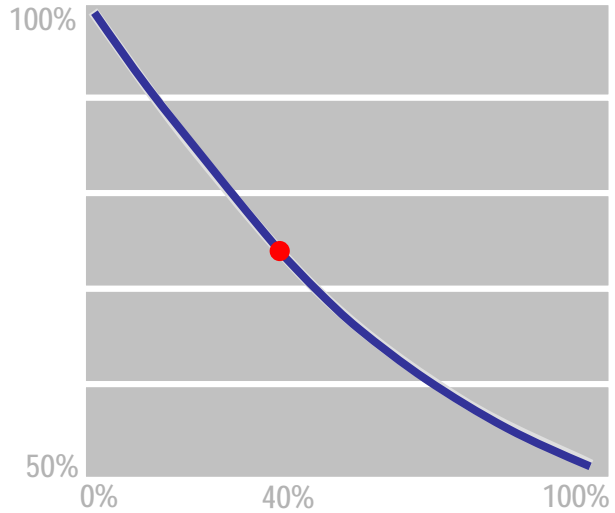The *y*-coordinate shows the percentage of primary outcome cases found in the top 40%.

Statistical Graphics – Response Chart

100%

50%

0%   40%   100%

top 40%

Repeat for all selection
fractions.

...
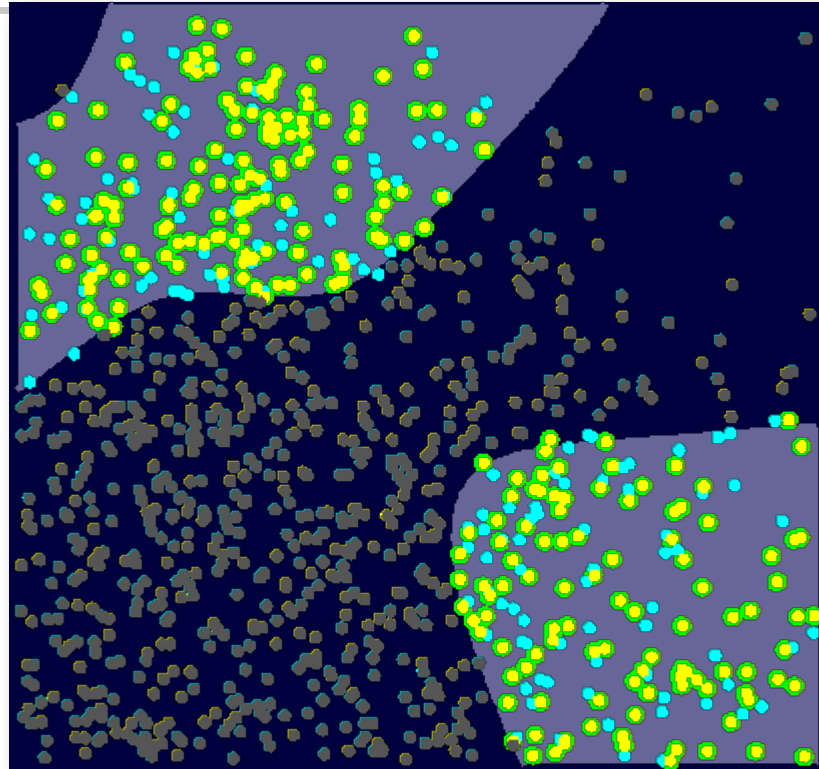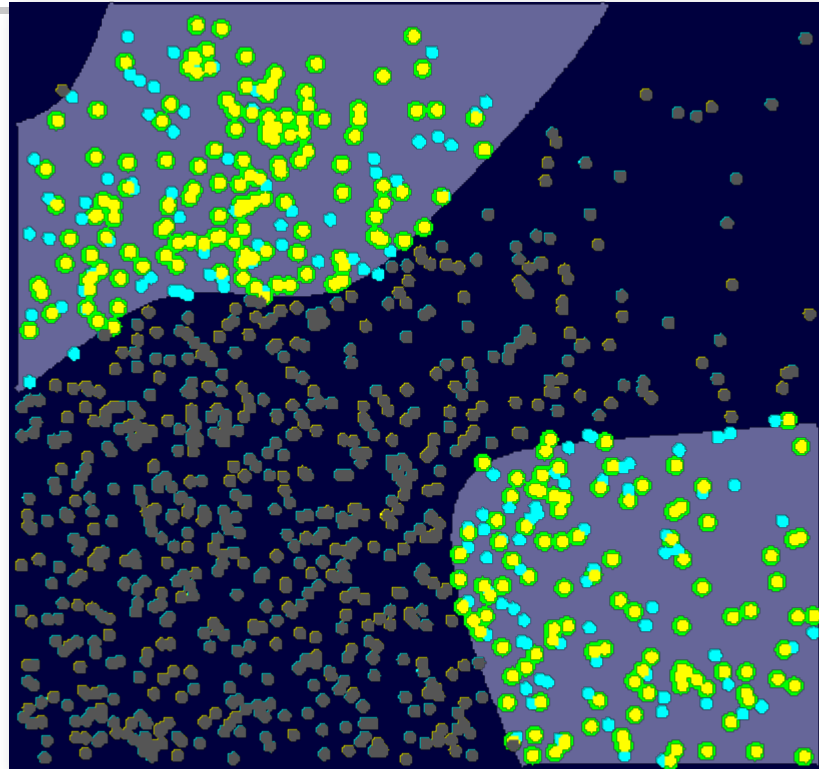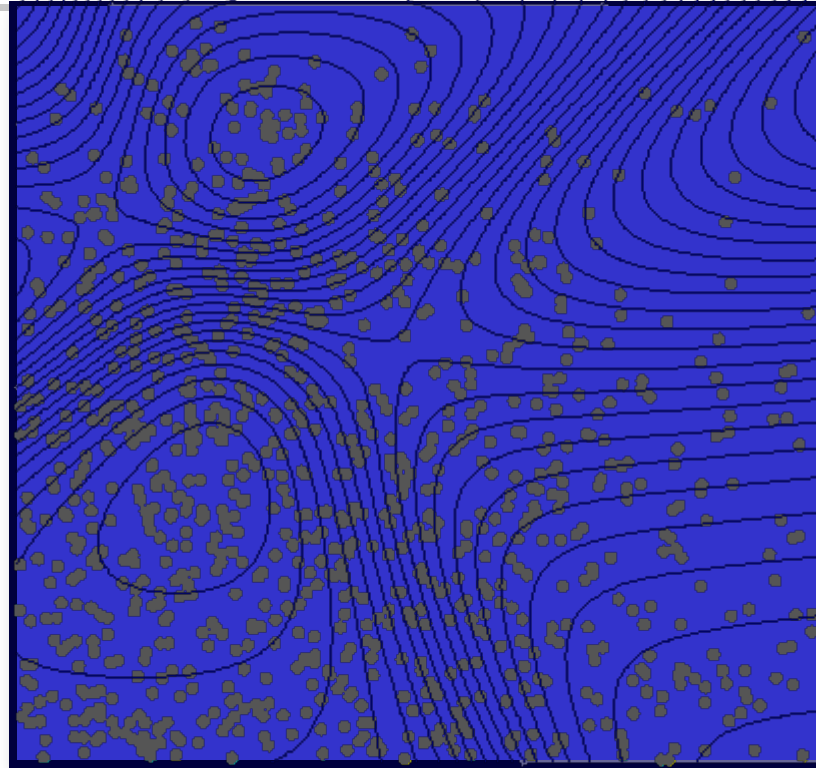
Demo: Comparing Models with Statistics and Charts

- Select the **Assess** tab.

- Drag a **Model Comparison** tool into the diagram workspace.

- Connect the Regression (optimal) node first, both decision trees (misclassification and probability), and finally the Neural Network (6 Neurons, Var Selection) node to the Model Comparison node

- Run and examine results