Random Forest

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What is random forest?

- The forest is made up of decision trees
- Supervised machine learning
- Ensemble approach for both
  - Classification (discrete)
  - Regression (continuous)
- Random

Breimen L. (2001) Random Forests. *Machine Learning*, 45, 5-32.

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- There are two types of decision trees
  - Classification trees
  - Regression trees

- CART (classification and regression trees)

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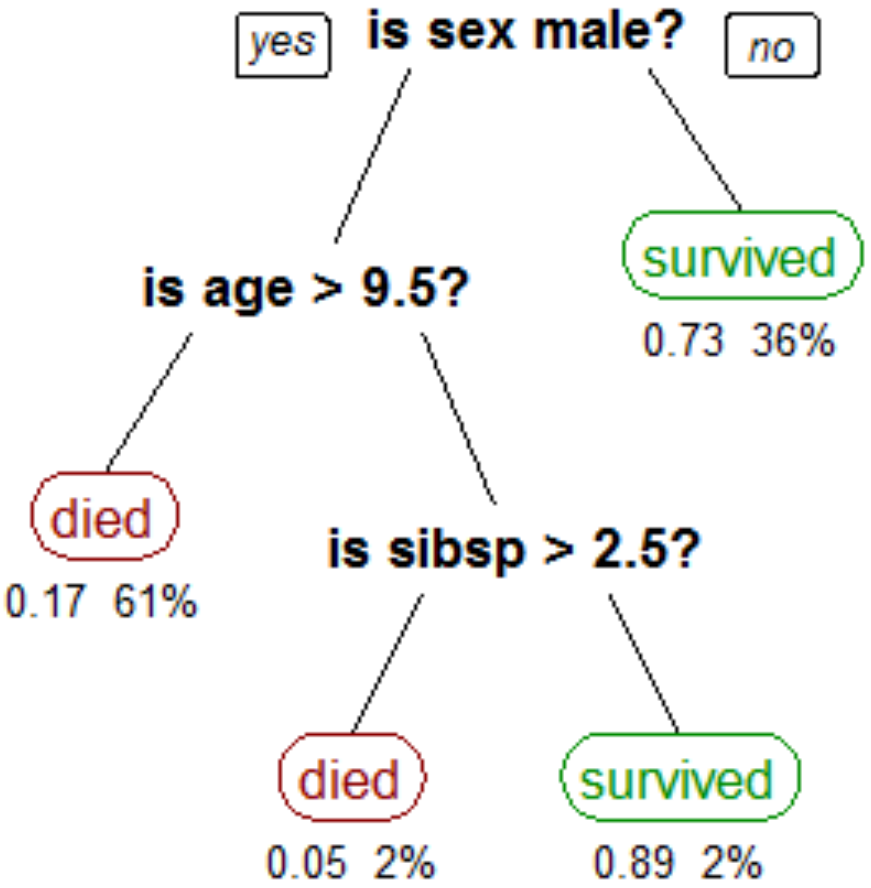

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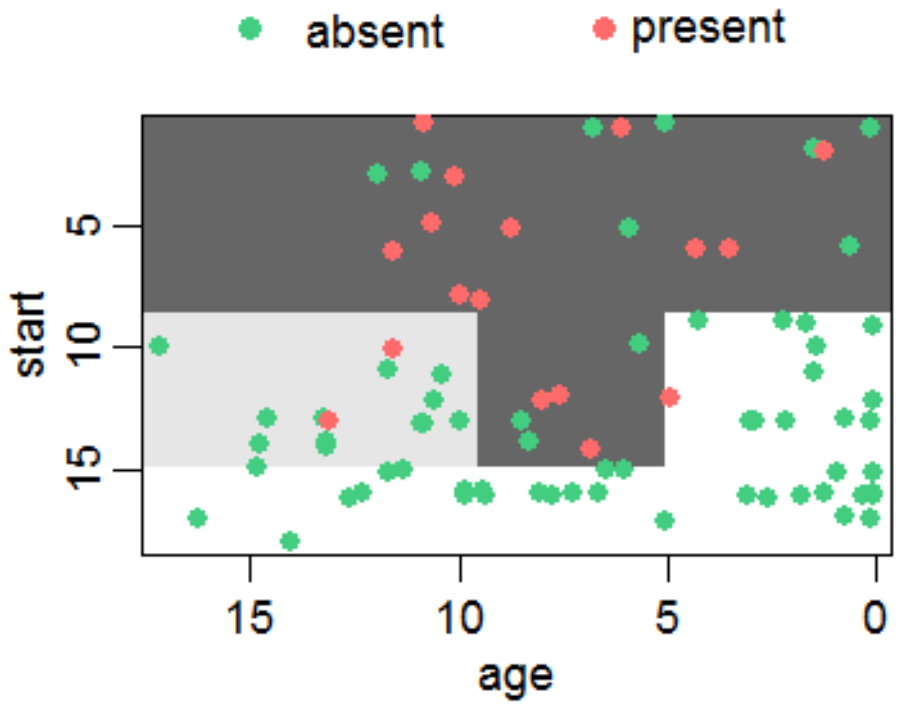

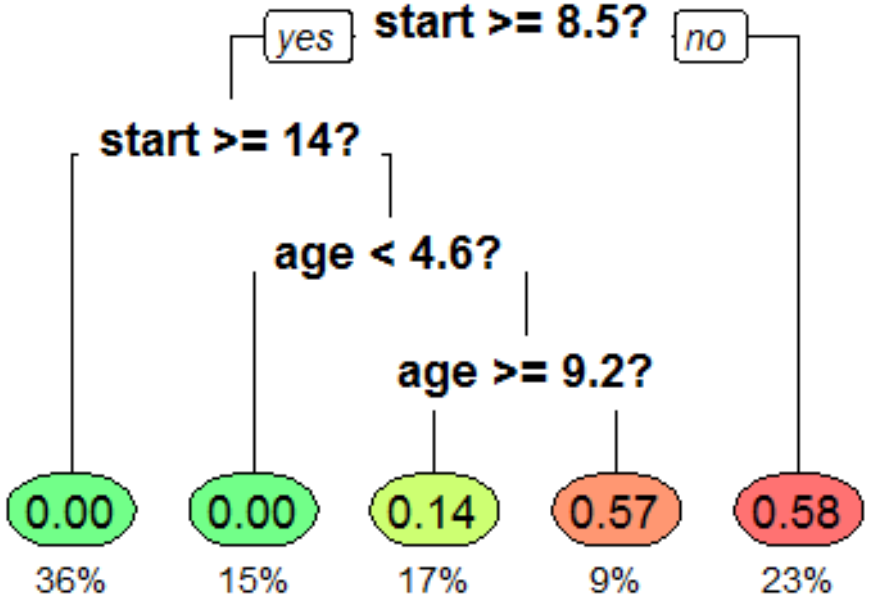

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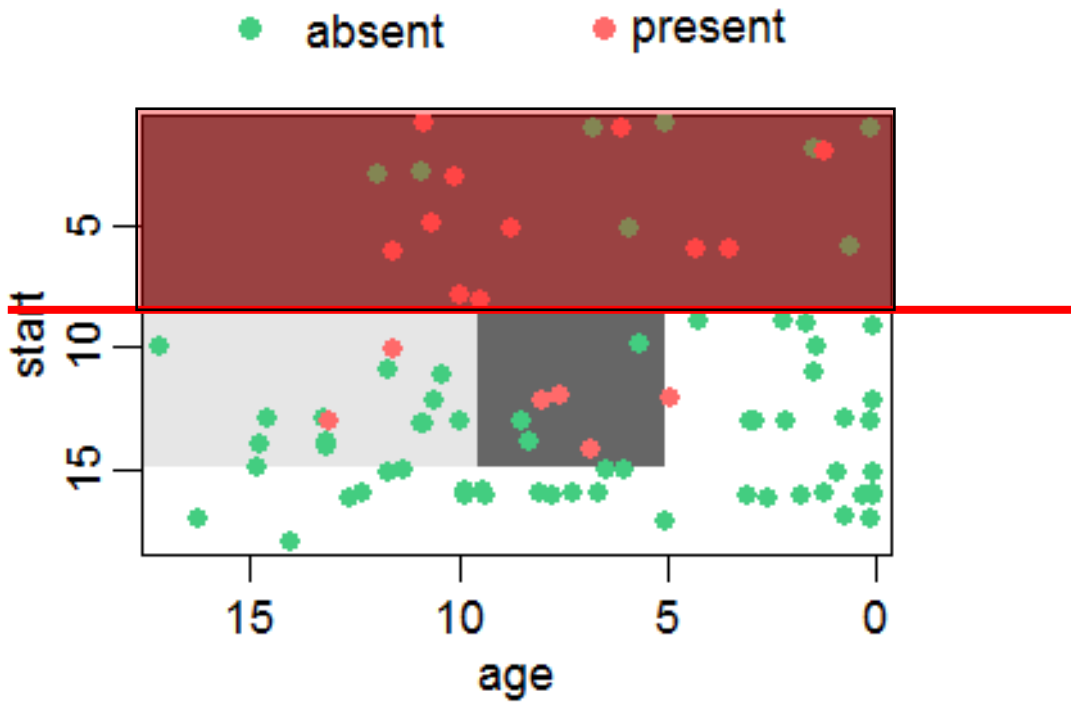

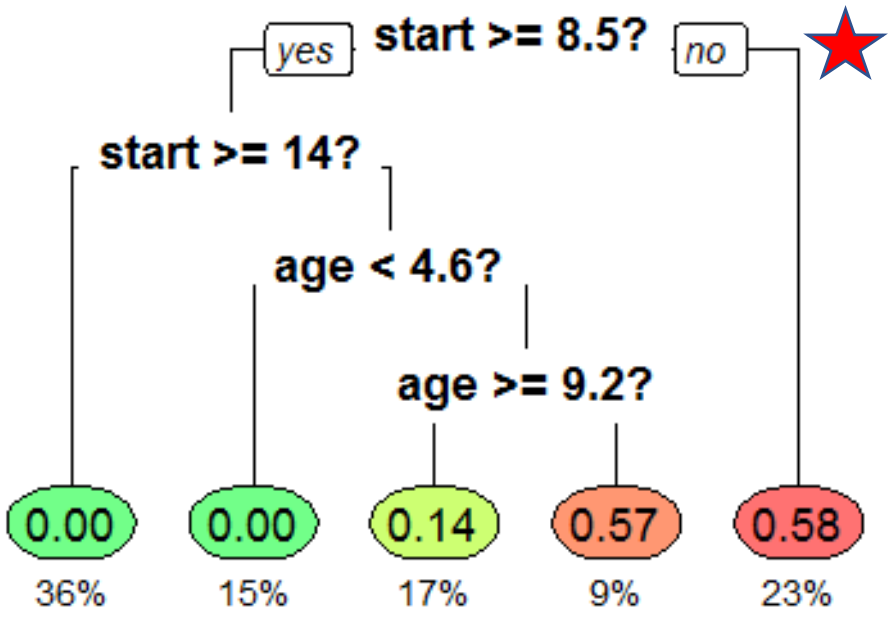

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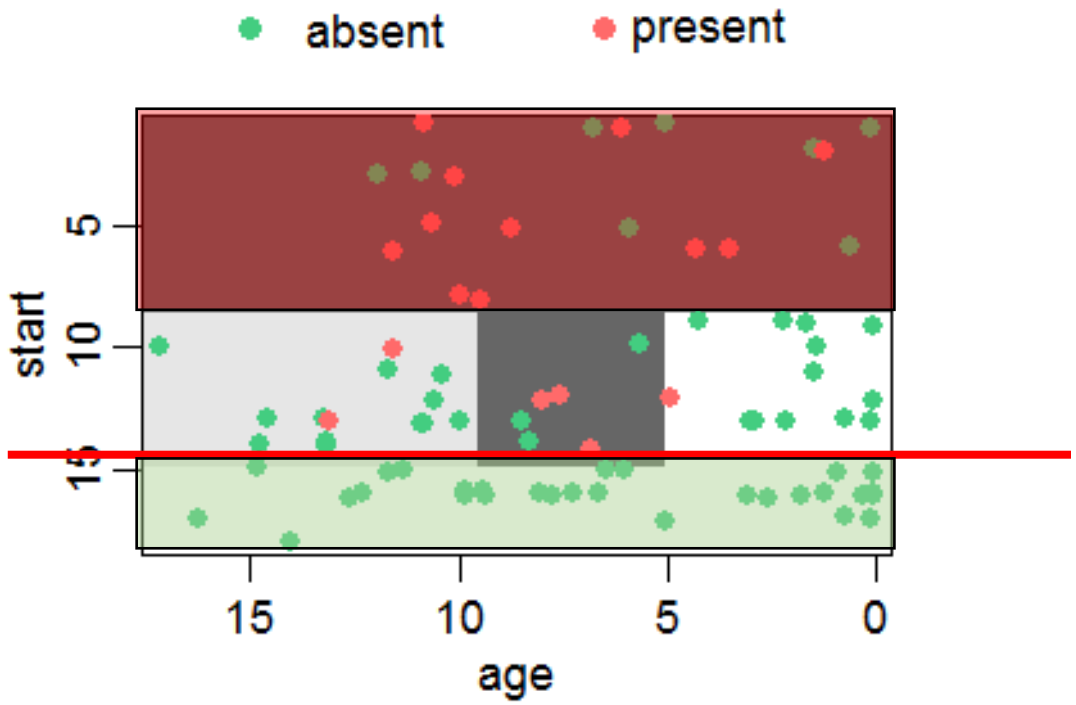

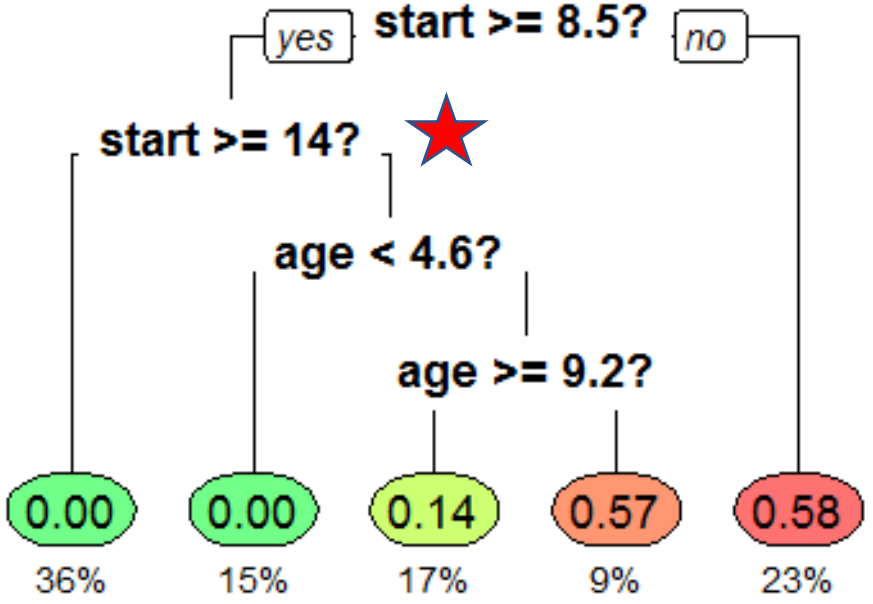

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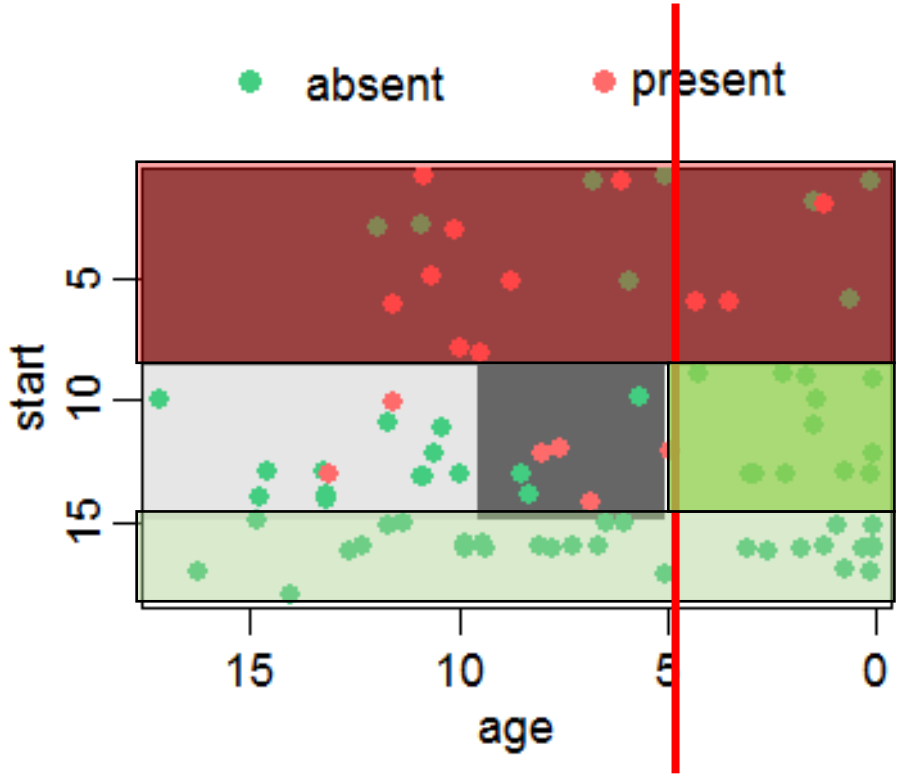

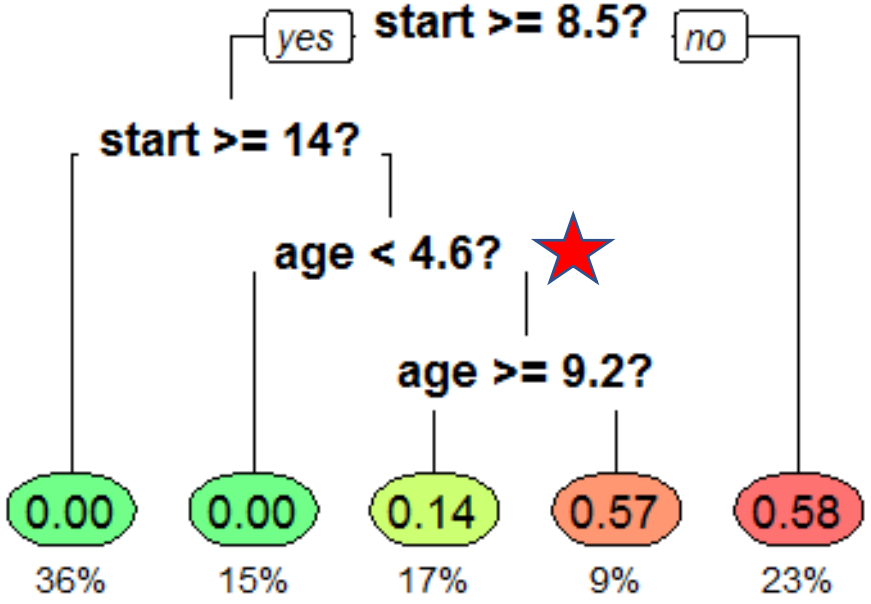

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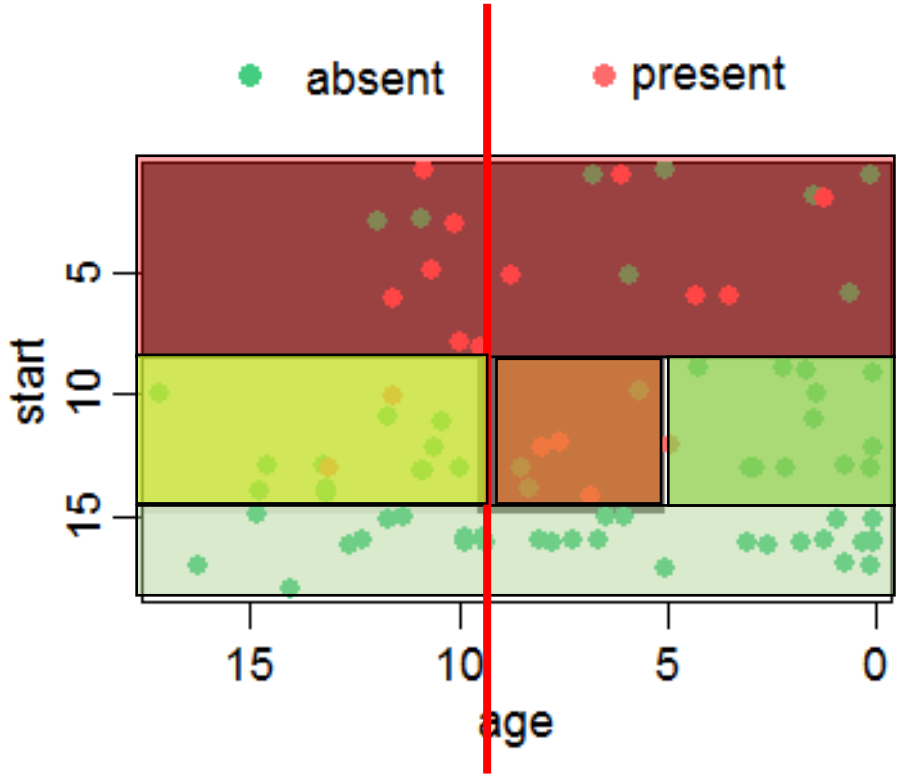

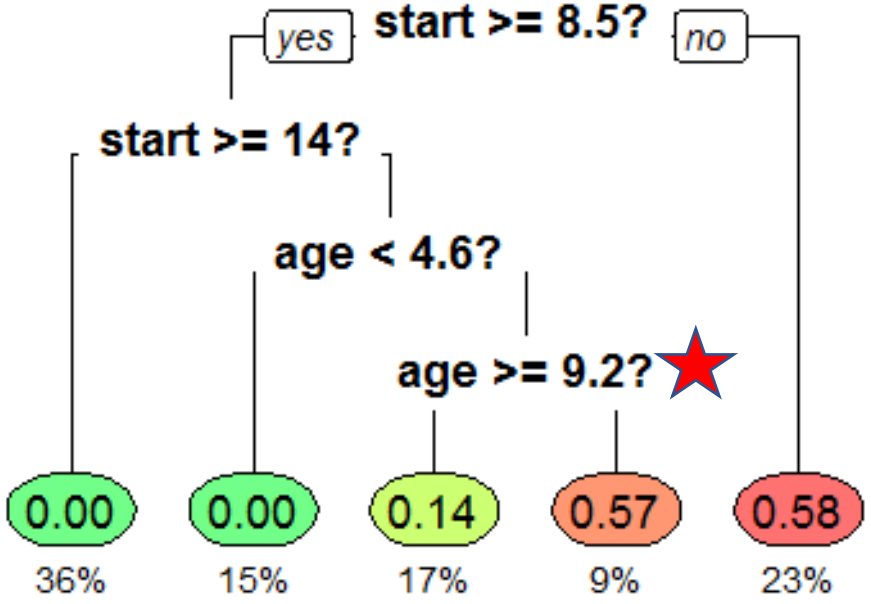

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  - These are a little bit more complicated. We will get into them later.

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- Trains a function that, given a sample of data and desired outputs, best approximates the relationship between input and output observable in the data.
- Required prior knowledge of what the output should be
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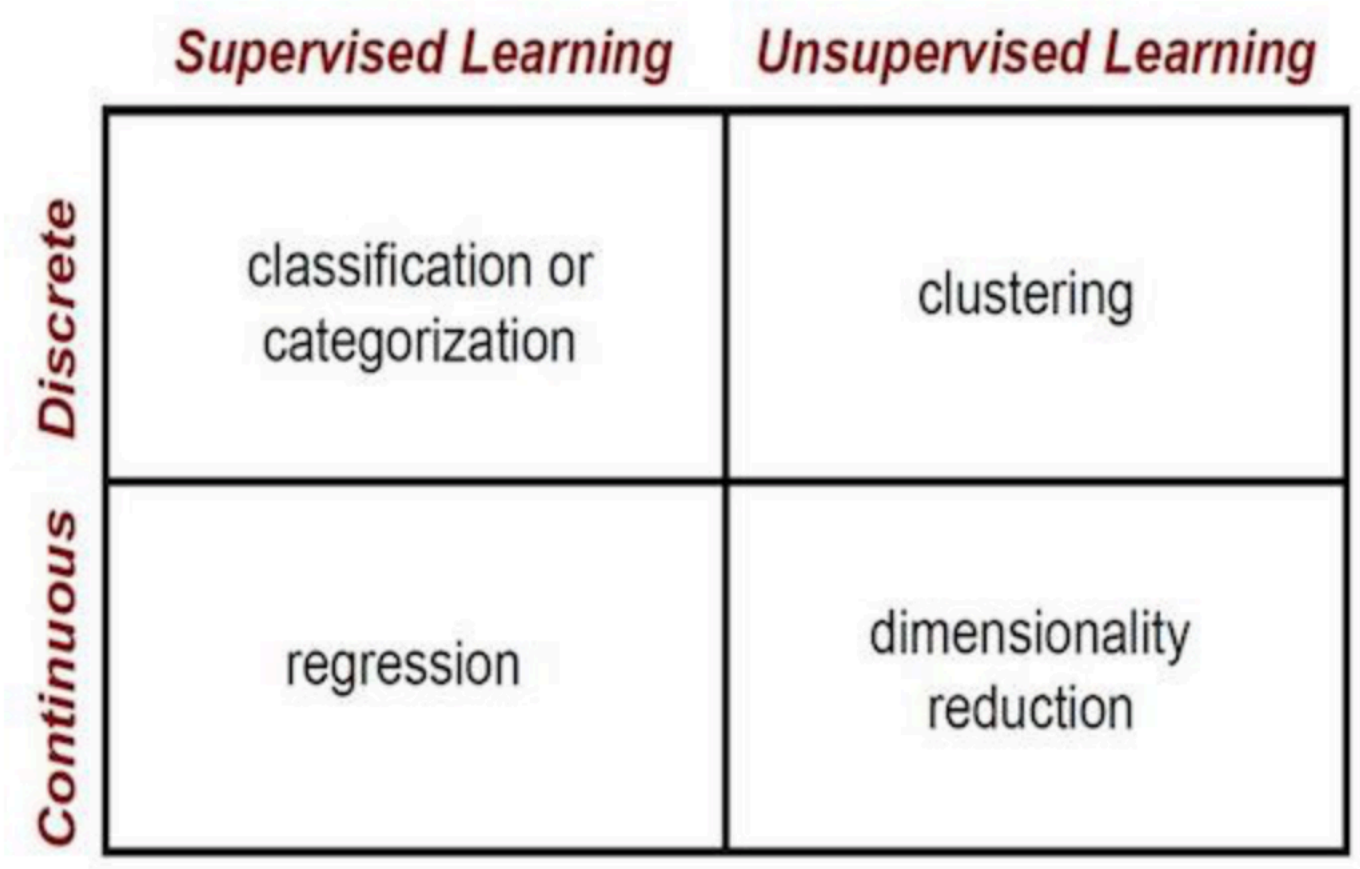
- Mainly for clustering and dimensionality reduction.

Supervised machine learning



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- Bagging
- Out of bag error

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