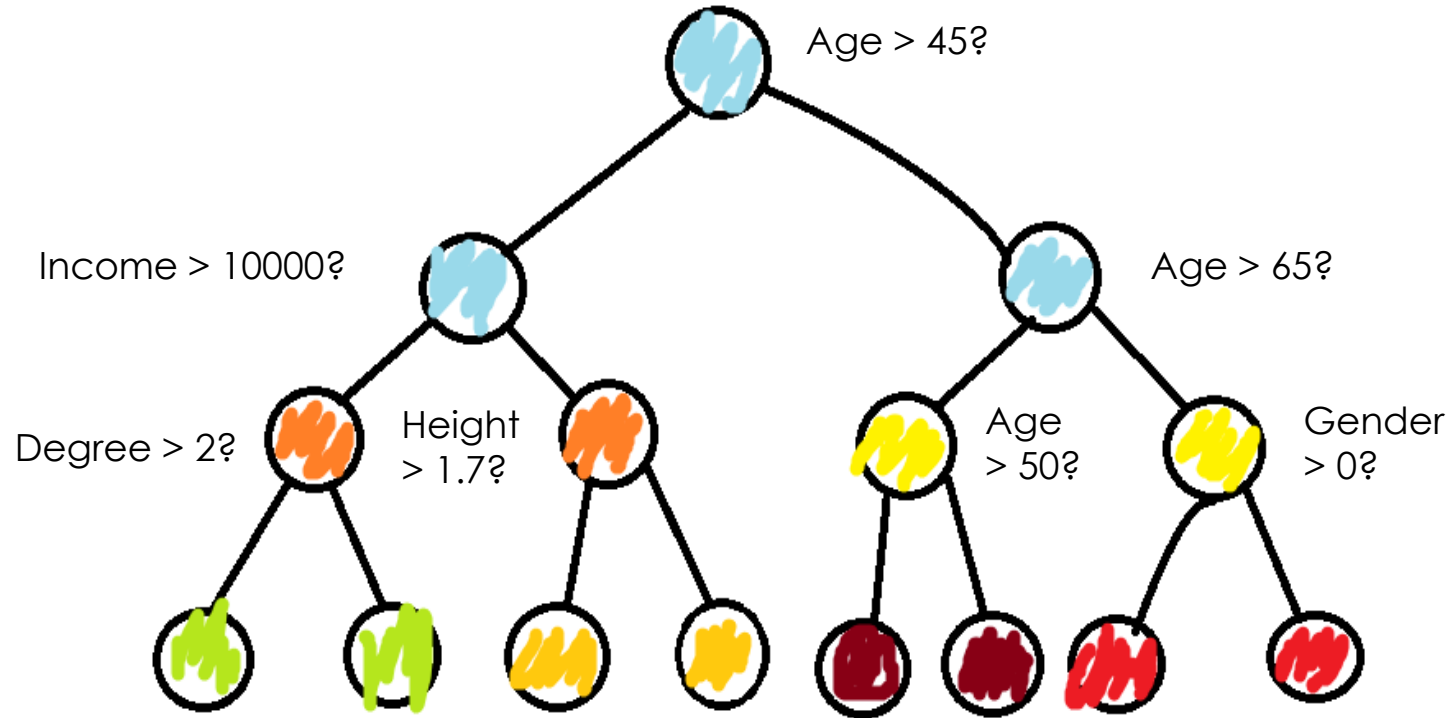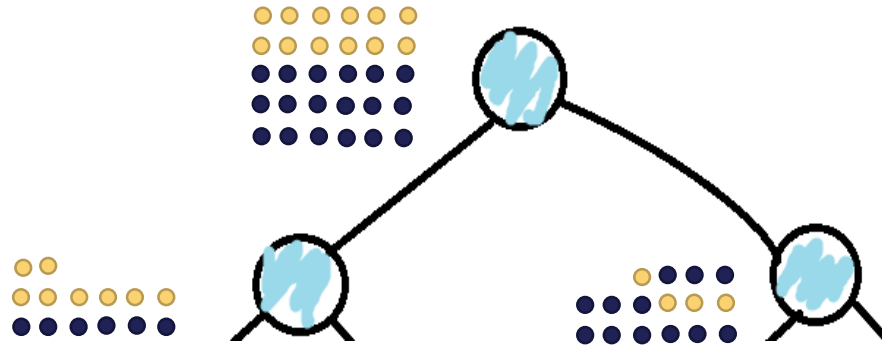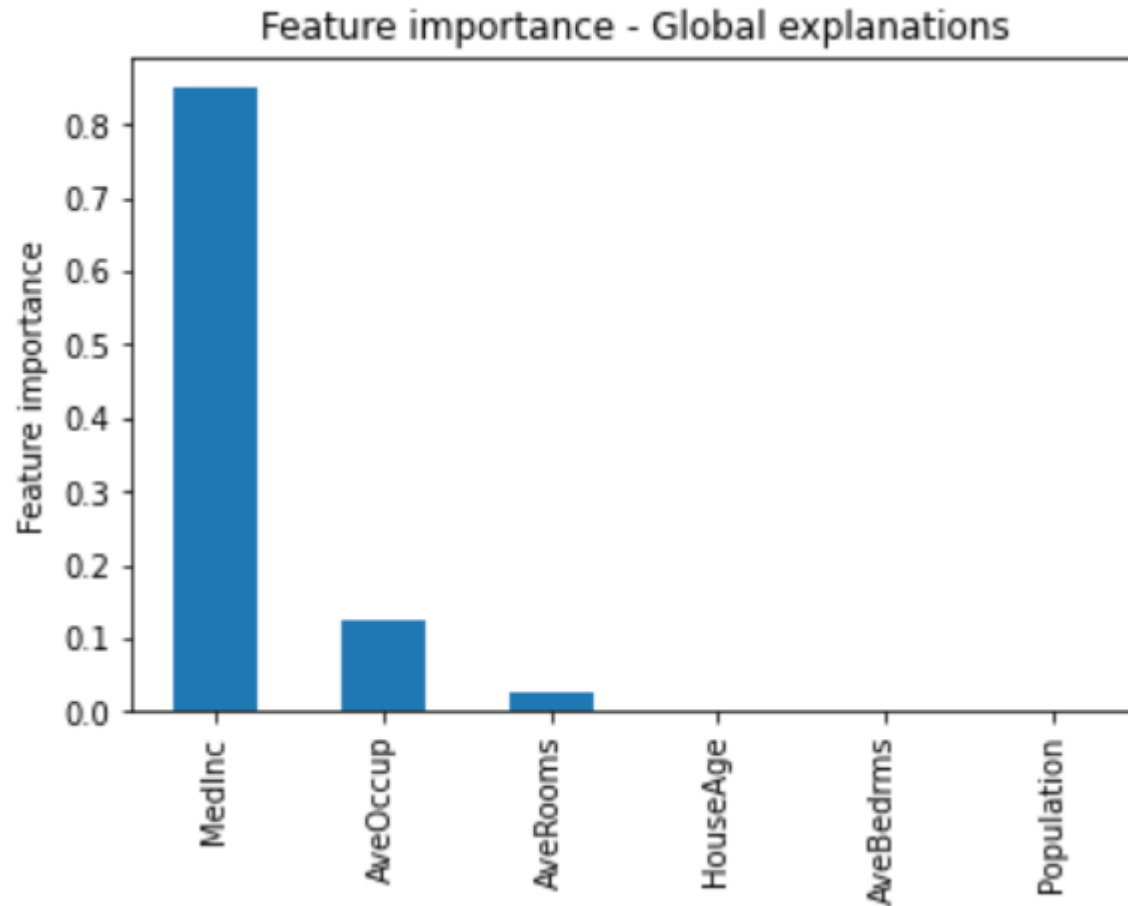# Explaining Random Forests

Feature importance

- How often a feature is chosen.

- How big the increase in purity is.

Feature importance

```
importances[node.feature] +=

weighted_n_node_samples * node.impurity -

(left.weighted_n_node_samples * left.impurity +

right.weighted_n_node_samples * right.impurity)
```

Feature importance

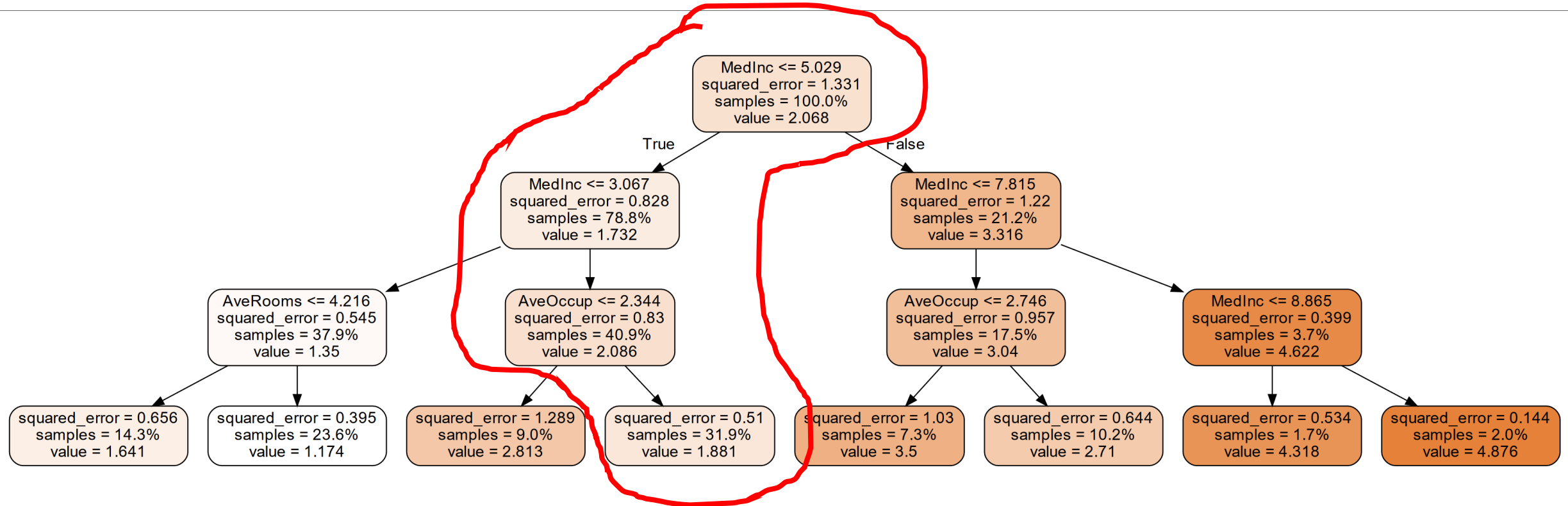Feature importance - Global explanations

- Features at top nodes have generally greater importance.
  - higher decrease in impurity.

- Features used in multiple nodes are more important.
  - Higher cumulative impurity decrease.
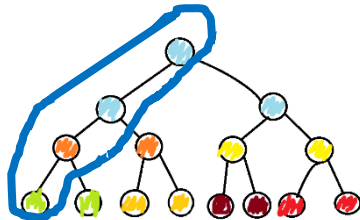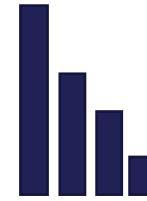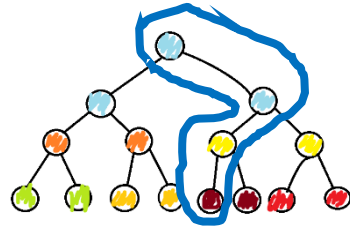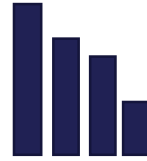
Global explanation

Take the average of all trees.
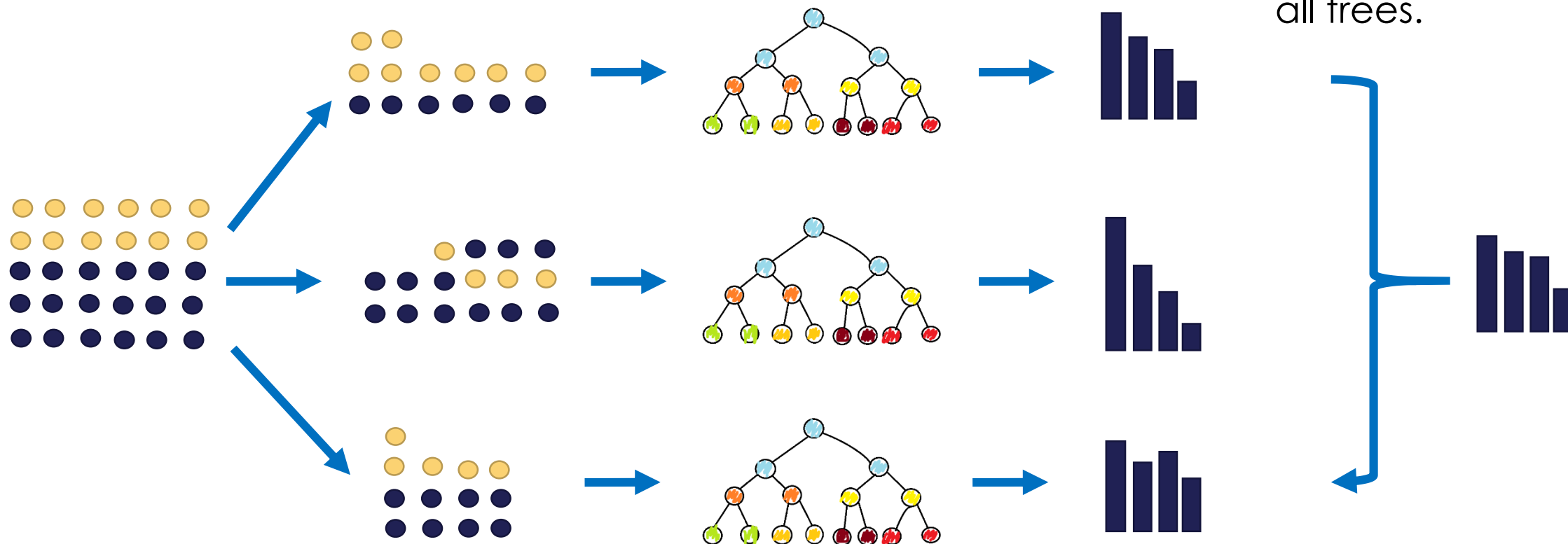
Local explanations

Local explanation
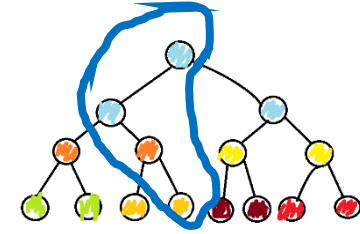
Take the average of all trees.

THANK YOU

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