Cost Complexity Pruning

- we can obtain a simpler tree by ‘pruning’ a complex one
- we select from an array of smaller subtrees of the full model that optimizes a balance of performance and efficiency

$$C(T) = \text{Error}(T) + \alpha |T|$$

where T is a decision subtree

$|T|$ is the number of leaves in the tree

α penalizes model complexity

1. Fix α
2. Find best tree for a given α and based on complexity C
3. Find the best using CV and error measure

Regression Trees: Pruning

Example: Hitters (ISLR2)