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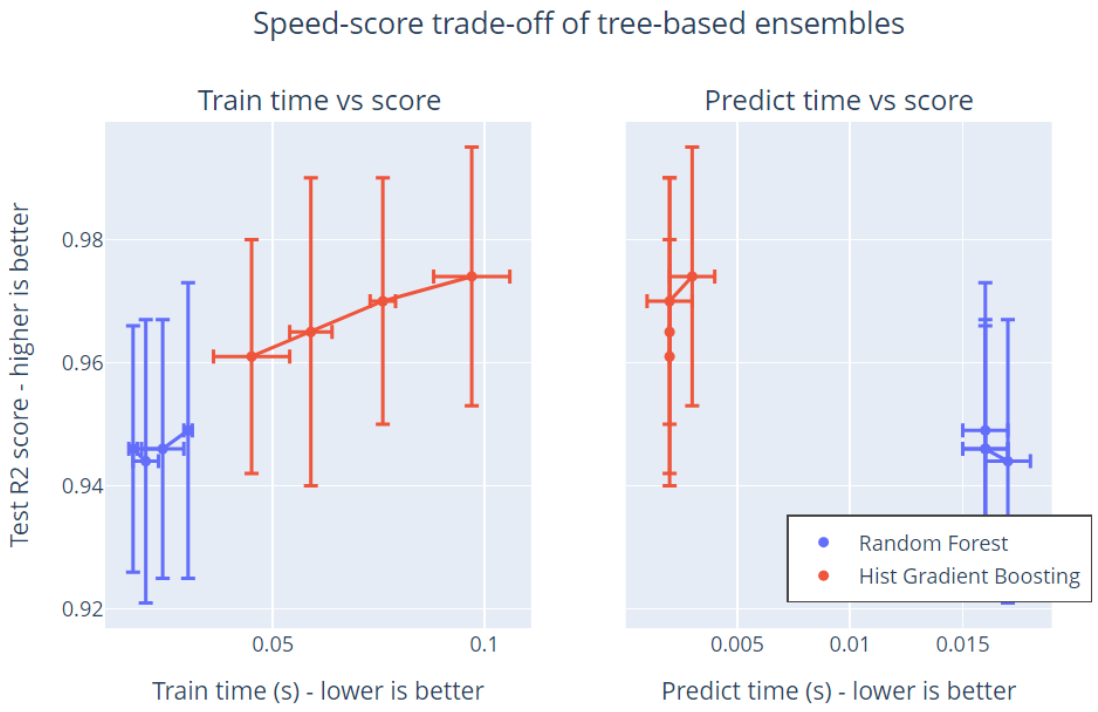
	Criterion = 'Entropy'	Criterion = 'Gini'
N_estimators = 10	[0.9027777777777778, 0.8388888888888889, 0.9164345403899722, 0.924791086350975, 0.8857938718662952]	[0.9111111111111111, 0.8666666666666667, 0.947075208913649, 0.9303621169916435, 0.8913649025069638]
N_estimators = 25	[0.9083333333333333, 0.8916666666666667, 0.9554317548746518, 0.9610027855153204, 0.9164345403899722]	[0.9333333333333333, 0.9111111111111111, 0.9498607242339833, 0.9610027855153204, 0.9052924791086351]
N_estimators = 50	[0.9361111111111111, 0.9, 0.958217270194986, 0.9637883008356546, 0.9164345403899722]	[0.9361111111111111, 0.9138888888888889, 0.9637883008356546, 0.9637883008356546, 0.9303621169916435]



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Part 4. Utility

Rocky = 2km/h (30min/km) Sandy = 3km/h (20min/km) Smooth = 5km/h (12min/km)

Route 1: 5km long -> 20% sandy, 30% smooth, 50% rocky

Route 2: 7km long -> 40% sandy, 20% smooth, 40% rocky

Route 3: 6km long -> 50% sandy, 40% smooth, 10% rocky

Q1: Which route should we pick?

Route 1: (0.2 * 20) + (0.3 * 12) + (0.5 * 30) = 4 + 3.6 + 15 = 22.6min/km * 5 = 113min

Route 2: (0.4 * 20) + (0.2 * 12) + (0.4 * 30) = 8 + 2.4 + 12 = 22.4min/km * 7 = 156.8min

Route 3: (0.5 * 20) + (0.4 * 12) + (0.1 * 30) = 10 + 4.8 + 3 = 17.8min/km * 6 = 106.8

The best route to pick is route 3

Route 1: 70% intact crater -> -20 min, 30% damaged crater -> +15 min

Route 3: 60% damaged bridge -> +40 min

Q2: Updates your estimated for the travel time, which route should we pick?

Route 1: (0.7 * -20) + (0.3 * 15) = -14 + 4.5 = -9.5 min + 113 min = 103.5 min

Route 2: 156.8 min

Route 3: (0.6 * 40) + (0.4 * 0) = 24 + 0 = 24 min + 106.8 min = 130.8 min

The best route to pick is now route 1

We now have an orbiting satellite to tell us whether route 2 is rocky or not. How long should we wait for the satellite?

First: If the satellite said that route 2 was not rocky, how long would we expect it to take?

Sandy: 40% / (40% + 20%) = 67%

Smooth: 20% / (40% + 20%) = 33%

Route 2: (0.67 * 20) + (0.33 * 12) = 13.4 + 3.96 = 17.36min/km * 7 = 121.52min

Second: What's the probability that the satellite will tell us this?

P(!rocky) = 1 – P(rocky) = 1 – 0.4 = 0.6 or 60%

Third: If the satellite tells us route 2 is in fact rocky, what do we do? How long will that take?

Route 2 = 7 * 30 = 210 min

Fourth: How long should we wait for the satellite?

Route 2 (with satellite) = P(!rocky) * t(!rocky) + P(rocky) * t(best) = (0.6 * 121.52) + (0.4 * 103.5) = 72.912 + 41.4 = 114.312min

Route 2 = 103min – 114.312 = -10.812

Since waiting increases travel time, is it not worth waiting for the satellite