

	FPR	FNR	Accuracy	Expected Value
Big Tree	0.4051698	0.3561356	0.6194	450,533,763
Pruned Tree	0.2771265	0.3456346	0.6886	459,122,167
Best Threshold Pruned Tree	0.9458972	0.01230123	0.5213	490,348,202

Expected values of strategy (c):

Number of Segment(*1K):

	Pos'	Neg'
Pos	$490(1-\beta)$	490β
Neg	510α	$510(1-\alpha)$

Profit of each Segment:

	Pos'	Neg'
Pos	\$1000	\$600
Neg	\$0	-\$400

$$\text{Expected Profit (*1K)} = 490(1-\beta)*1000 + 490\beta*600 + 0.5*510(1-\alpha)*600 - 0.5*510(1-\alpha)*400$$

Big Tree:

	LEAVE	STAY
LEAVE	1979	1187
STAY	1348	2146

Accuracy: 0.6194

$$\text{FPR}(\alpha) = 1348 / (1979 + 1348) = 0.4051698$$

$$\text{FNR}(\beta) = 1187 / (1187 + 2146) = 0.3561356$$

$$\text{Expected Profit} = 541000*1000 - 510000*100\alpha - 490000*400\beta = 450,533,763$$

Pruned Tree:

	LEAVE	STAY
LEAVE	2405	1152
STAY	922	2181

Accuracy: 0.6886

$$\text{FPR}(\alpha) = 922 / (2405 + 922) = 0.2771265$$

$$\text{FNR}(\beta) = 1152 / (1152 + 2181) = 0.3456346$$

$$\text{Expected Profit} = 541000*1000 - 510000*100\alpha - 490000*400\beta = 459,122,167$$

Best Threshold Pruned Tree:

	LEAVE	STAY
LEAVE	180	41
STAY	3147	3292

Accuracy: 0.5213

$$\text{FPR}(\alpha) = 3147 / (3147 + 180) = 0.9458972$$

$$\text{FNR}(\beta) = 41 / (41 + 3292) = 0.01230123$$

$$\text{Expected Profit} = 541000*1000 - 510000*100\alpha - 490000*400\beta = 490,348,202$$