A customer that stays will provide a NPV of $1,000 to the carrier and the NPV from a customer who leaves is $0. (α: FPR; β: FNR)

Strategy a) No change in policy

Profit = 490k (remaining clients) \* $1000 = $490 Million

Strategy b) Offer Discounts to all

Cost = $400 \* 1 Million Customers = $400 Million

Revenue = 490k (Remaining clients) + 510K \* ½ \* 1000 = $745 Million

Profit = $345 Million

Strategy c)

Net from using classifier:

Number in each segment:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predict Number | | |
| Actual Number |  | STAY’ | LEAVE’ |
| STAY | 490K ×(1-β) | 490K×β |
| LEAVE | 510K×α | 510K×(1-α) |

After offering a discount of $400 to those we predict “leave”, customers who were going to stay will continue to stay and enjoy the discount. The profit each of them brings to carrier is ($1000-$400). 50% of customers who were likely to leave will now stay and the profit each of them brings to carrier is also ($1000-$400).

Profit from each segment

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predict | | |
| Actual |  | STAY’ | LEAVE’ |
| STAY | 1000 | 1000-400 |
| LEAVE | 0 | For 510K×(1-α)×0.5 customers:  1000-400 |

Net Value = 490K(1-β)×1000+490K×β×(1000-400) + 510K×(1-α)×0.5×(1000-400)

= 643,000,000 – 153,000,000α - 196,00,000β

Table with FPR, FNR, Accuracy, Expected Value of each tree.

