

Allstate Prediction: Automated Decisions System Nutritional Label

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ALLSTATE PURCHASE PROTECTION SUBMISSION

The Allstate Purchase Prediction Challenge (APPC) seeks to shorten the insurance quoting process by predicting a customer's purchase sooner in the shopping window, in turn, lessening the likelihood that the issuer will lose the customer's business.

ADS owner's faults

Our interpretations

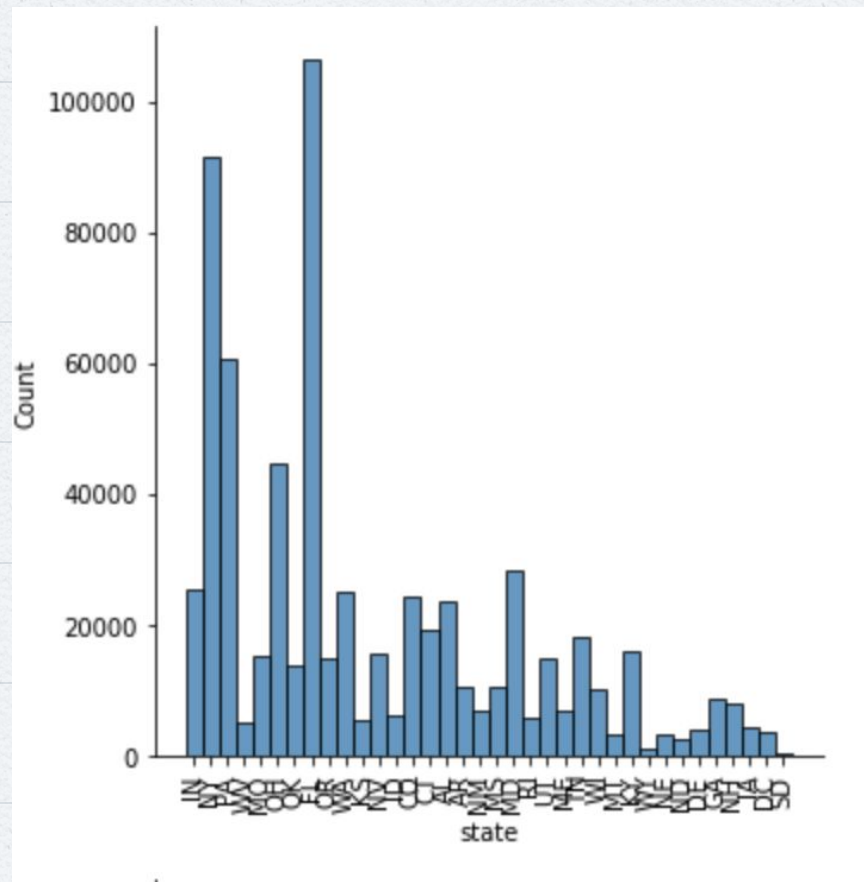
- Fails to handle NaNs in risk factor and location of test data
- So replace NaNs with 0 for location

- Accuracy scores differ across all plans
- Lack of ranges in predictions \rightarrow the distribution is skewed; except E
- Removed duplicate columns

- States
- Married couples
- Age
- XGBoost for understanding
 - Plan A

RANDOM FOREST CLASSIFIER

Original number of estimators was 600, with no limits to depth. The program would run forever so we changed the number of estimators to 100. Then the depth of the tree kept crashing the notebook because it used up all the RAM. So we had to limit it to 5.





All Customers

risk_factor high low mid mid-high



married_couple

married	21214	27448	24434	22697
single	89540	72028	72596	94874

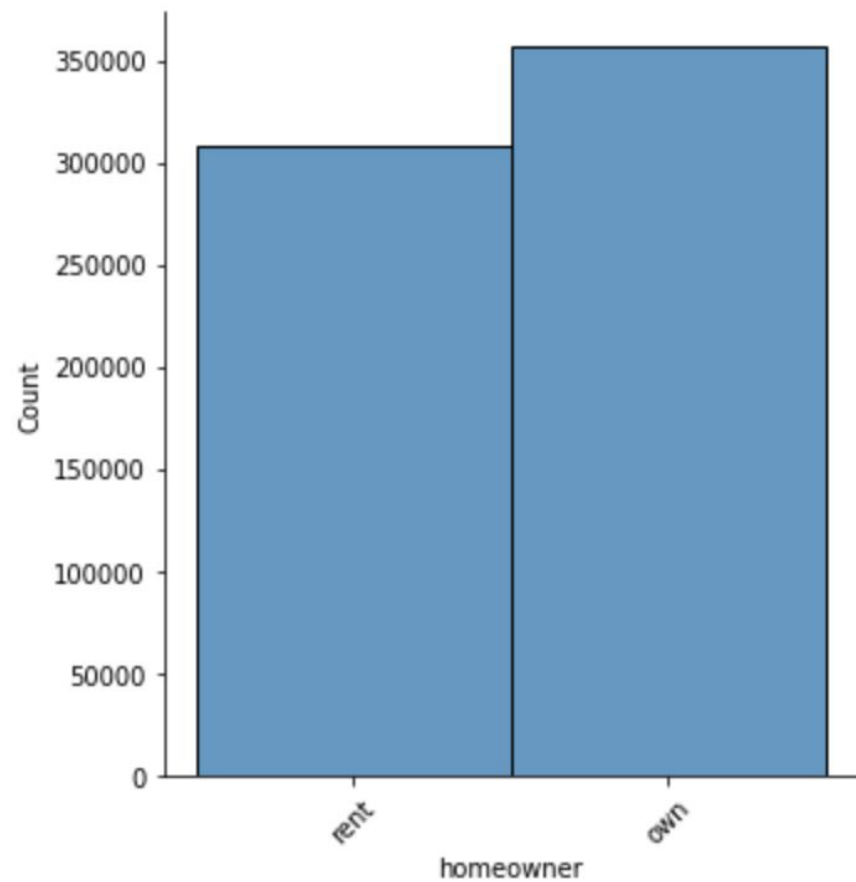
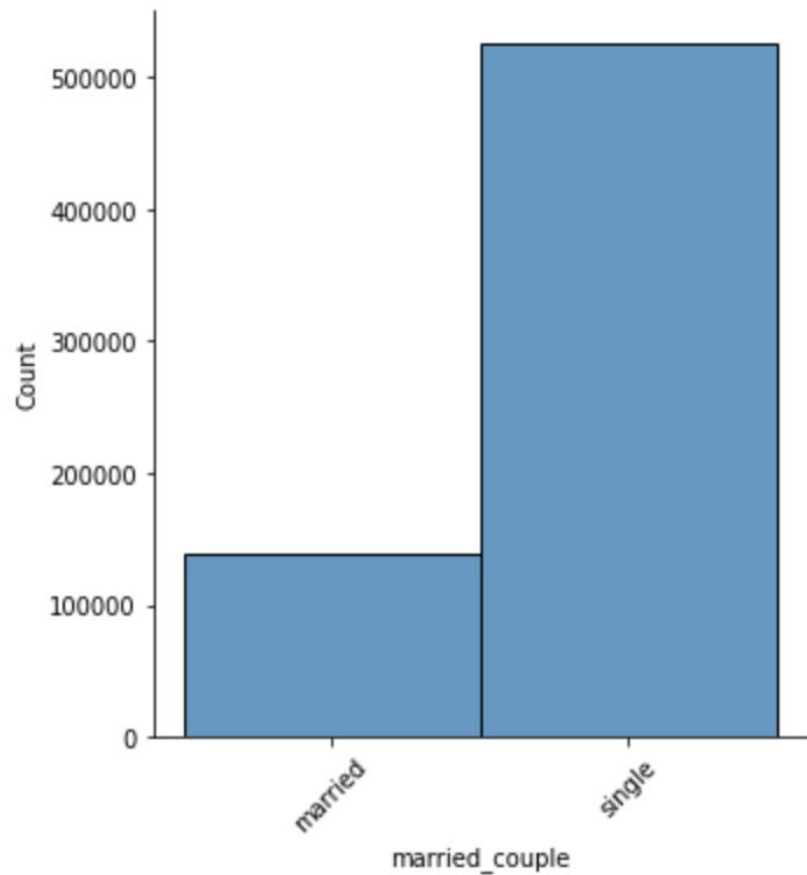
All Customers

risk_factor high low mid mid-high

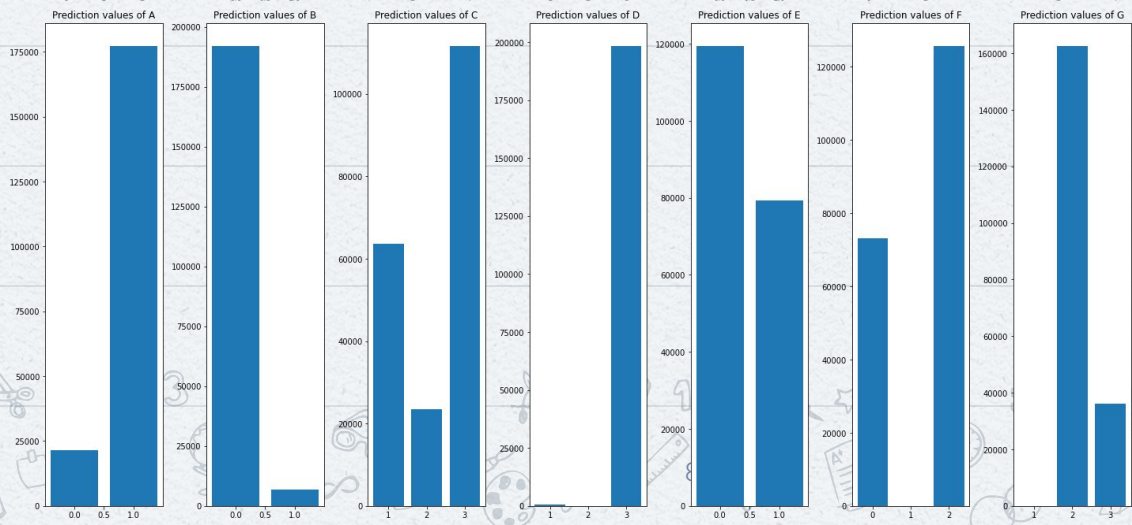
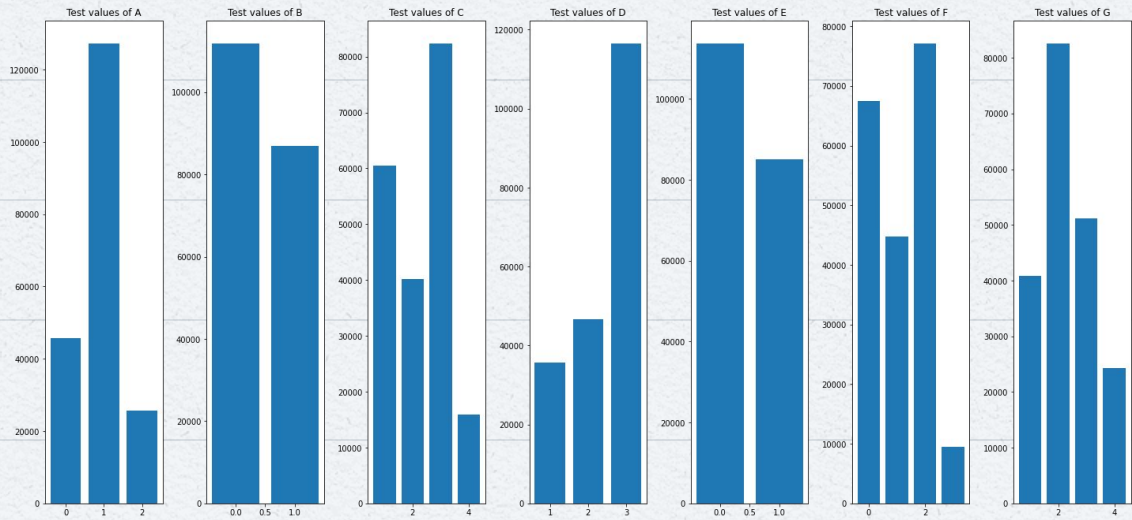


age_youngest

21-25	16400	5906	10954	16301
25-30	18683	6866	10305	12715
30-45	30005	15155	19586	26451
45-55	16819	13200	14508	16747
55-65	13492	20355	16661	15579
< 21	4171	1845	2858	11124
>65	11184	36149	22158	18654

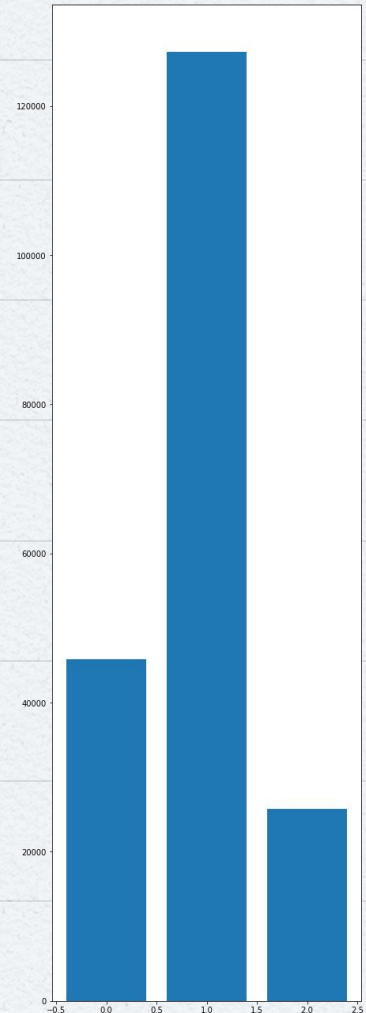


Counts for what type of plan was purchased for each insurance option from A to G

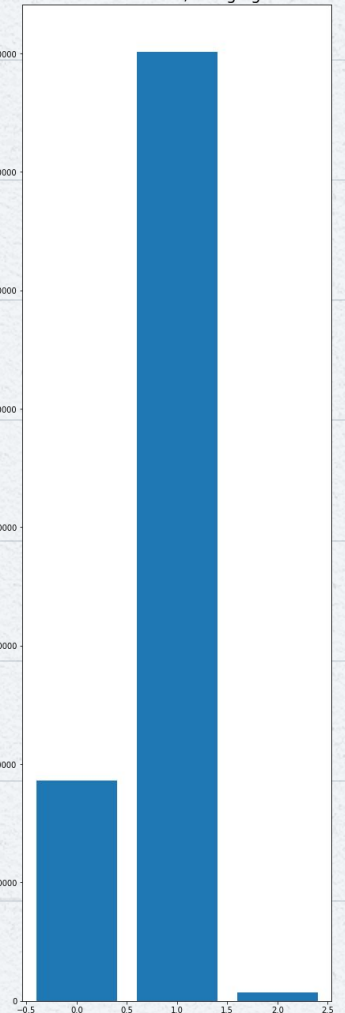


Counts for what type of plan was purchased for insurance option A, using xgboost tree

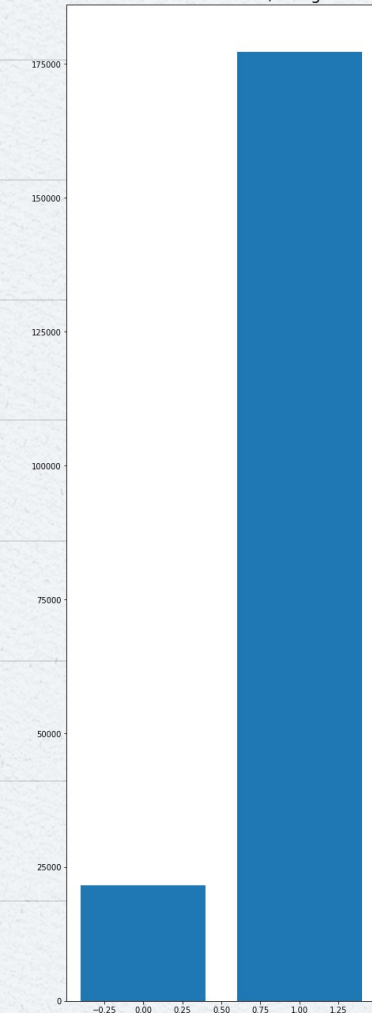
Test values of A

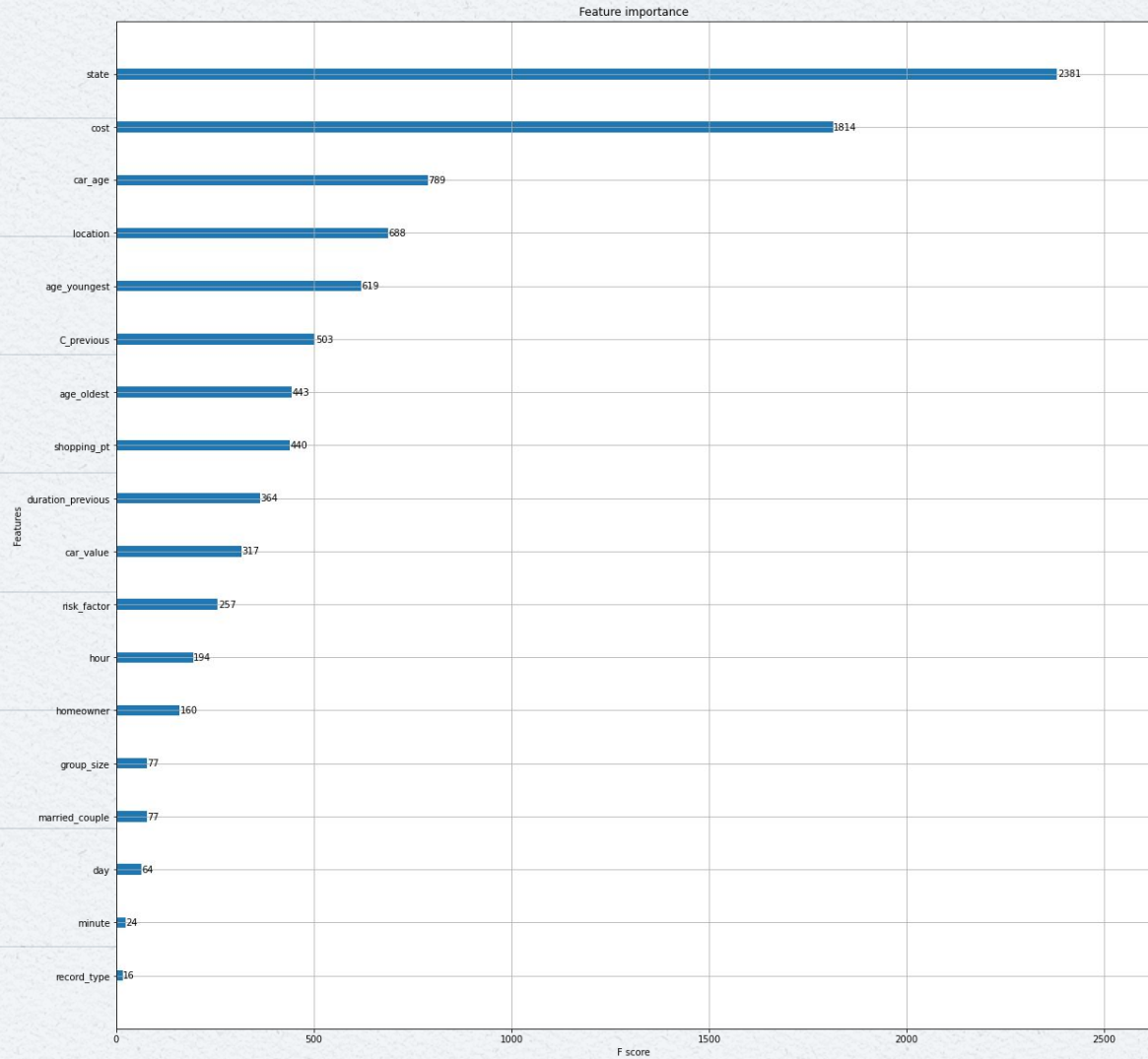


Prediction values of A, using xgboost tree

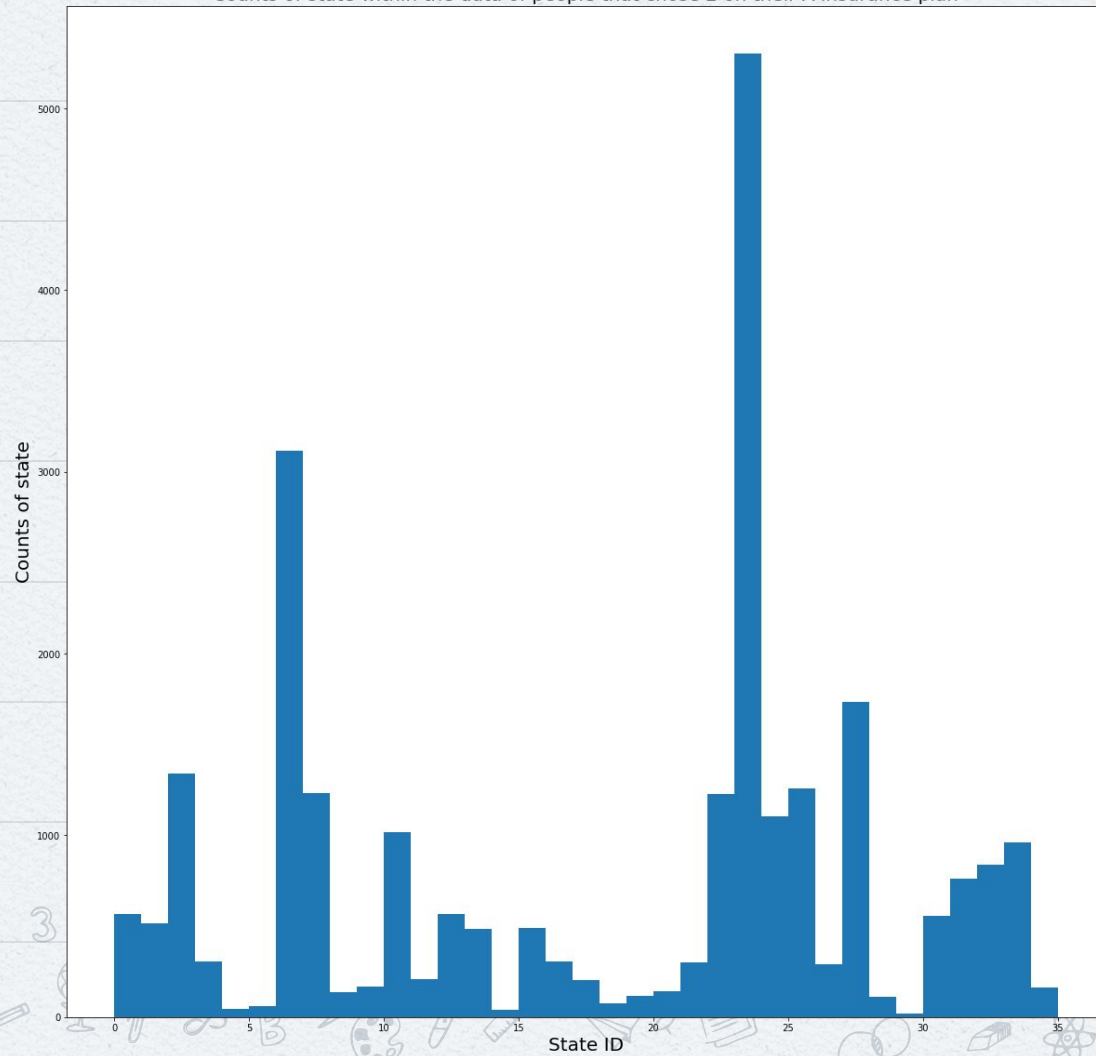


Prediction values of A, using rfc





Counts of state within the data of people that chose 2 on their A insurance plan



Counts of state within the data of people that did not choose 2 on their A insurance plan

