



Insurance Premium Prediction

Regression Approach towards Insurance Database

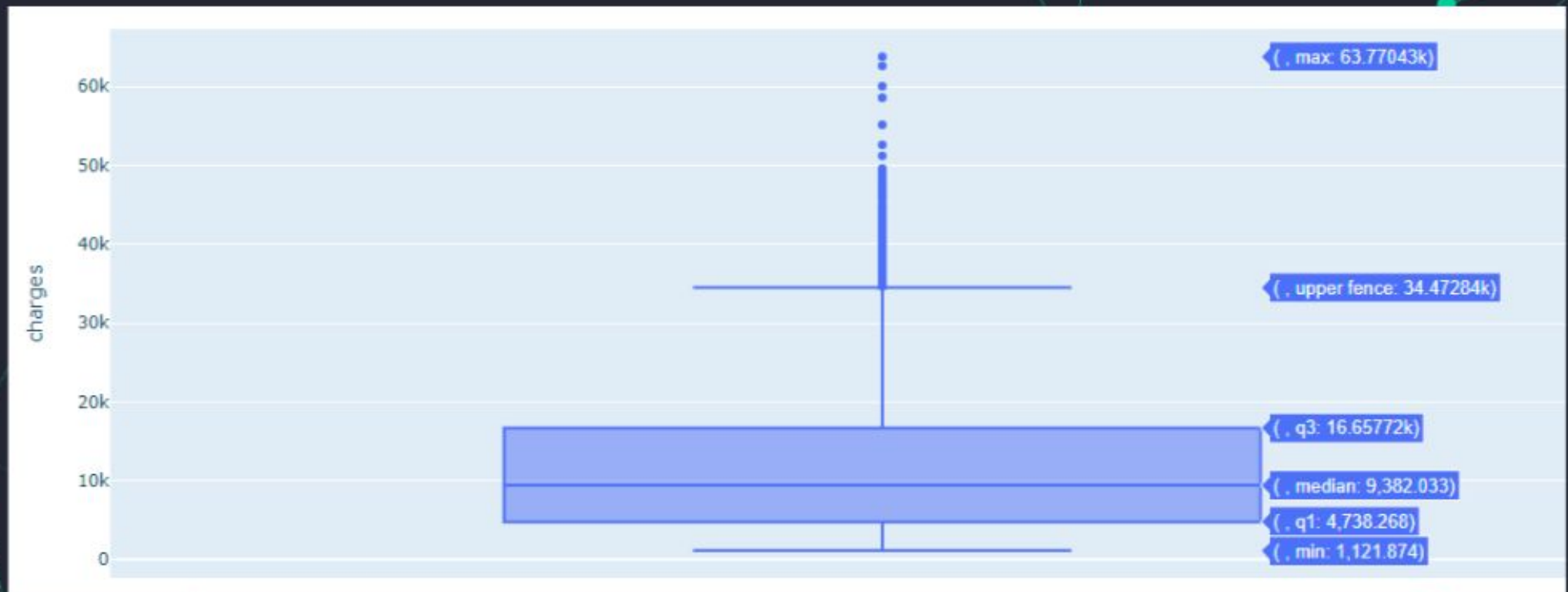


Business Objective

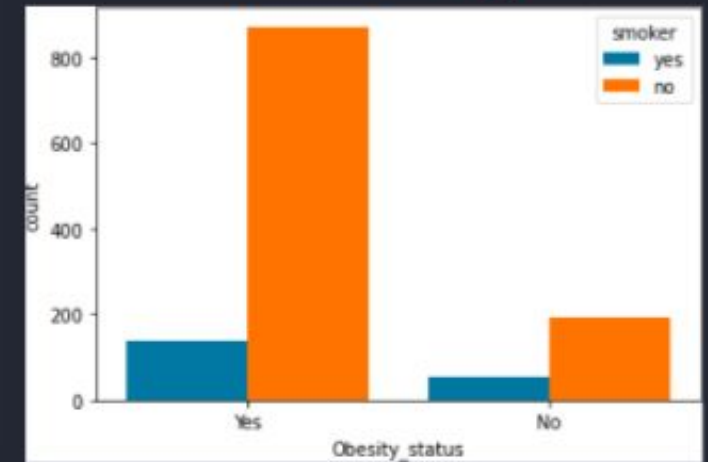
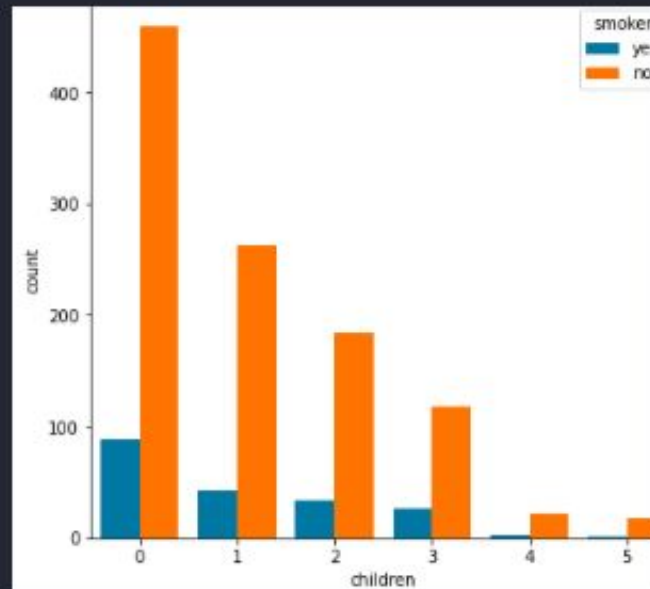
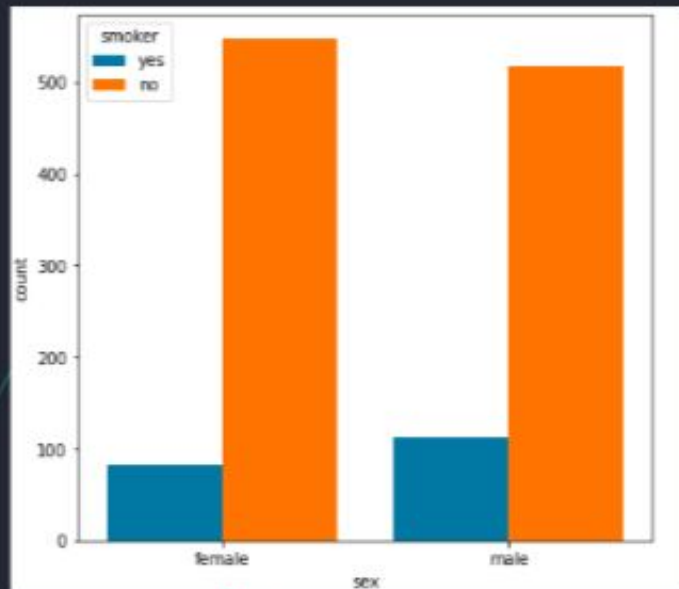
To perform regression and to predict insurance policy amount.



Understanding Cleaned Data



Understanding Cleaned Data

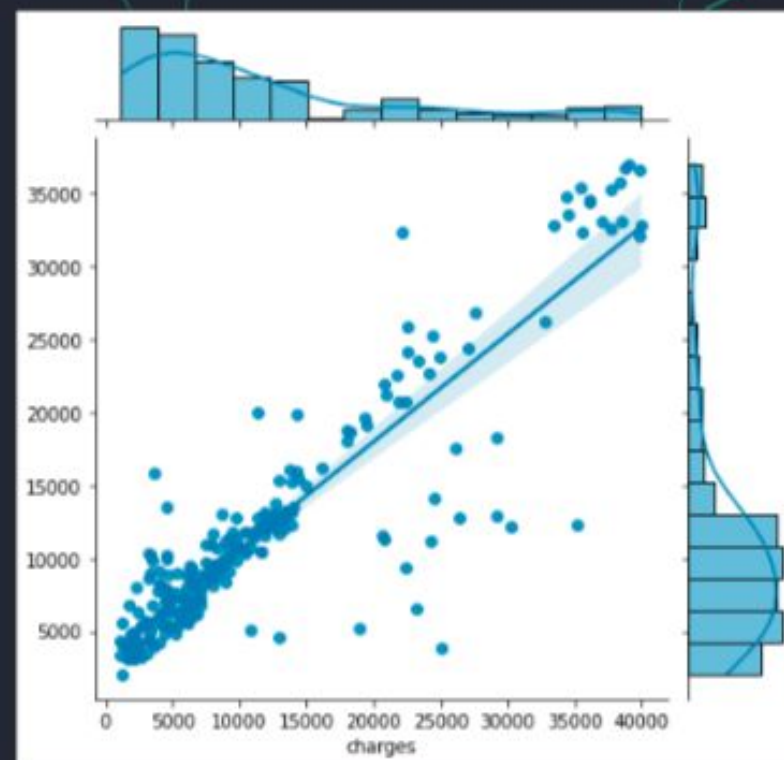


MODEL SELECTION & IMPROVED RESULTS

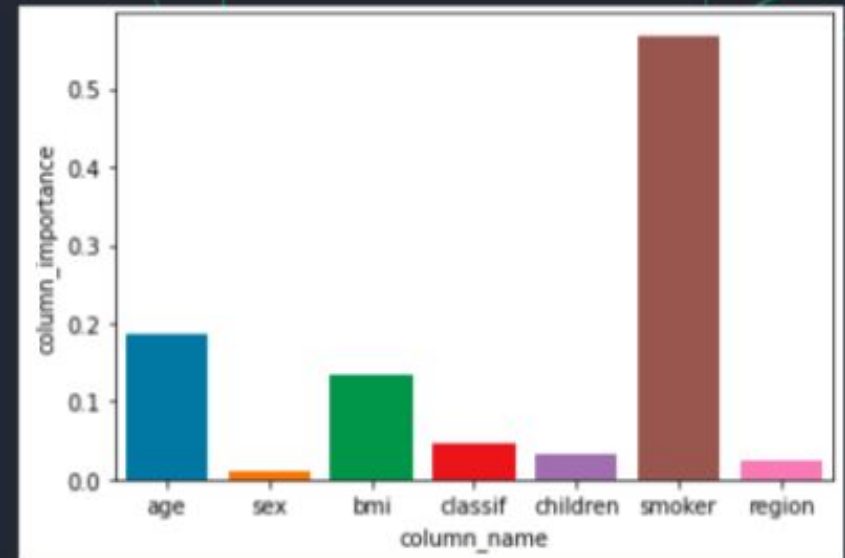
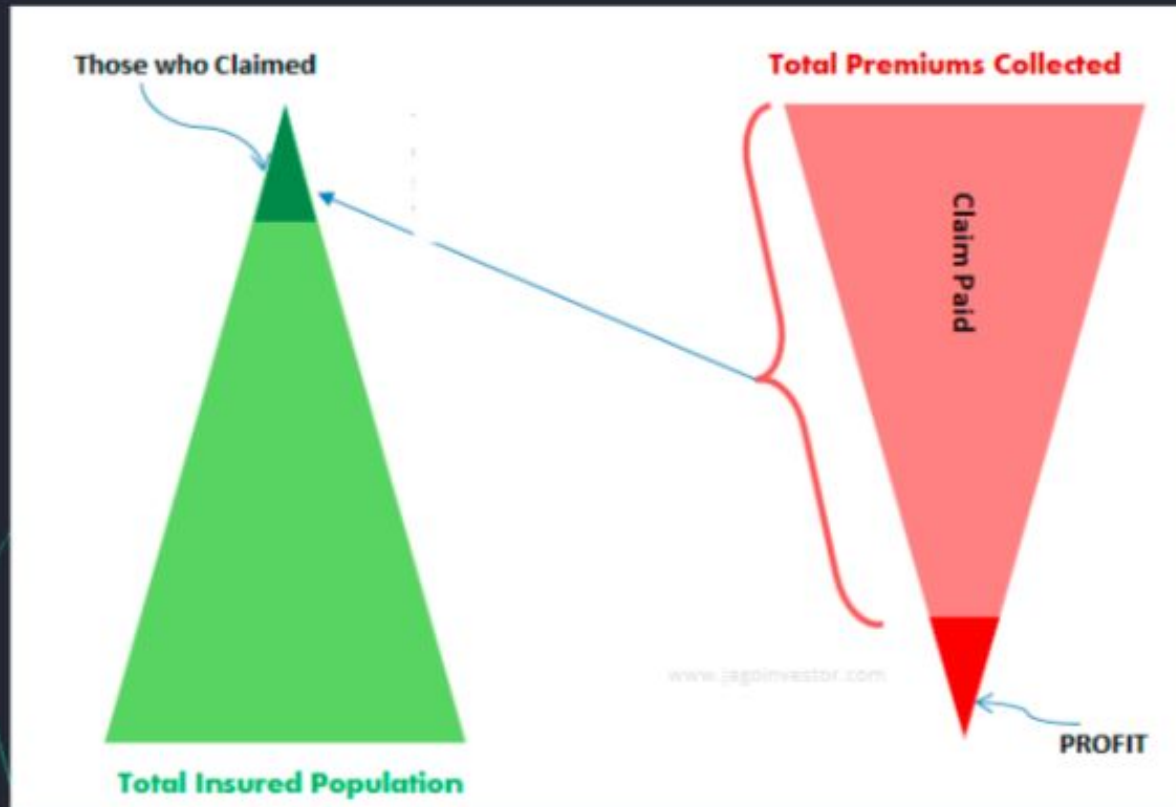
	MODELS	MAE	RMSE	R^2_CV_score
0	LR	3671.3072	5312.39366	0.619475
1	DTR	2423.329242	4247.821924	0.738355
2	RFR	2405.048447	4075.680009	0.755337
3	KNR	3787.08214	4866.411729	0.613357
4	STACKING	-	-	0.743143

	MODEL	R^2 Score
0	RFR	0.768337
1	RFR-tuned	0.940537

There is a 22.4% increase in model performance after hyperparameter tuning.



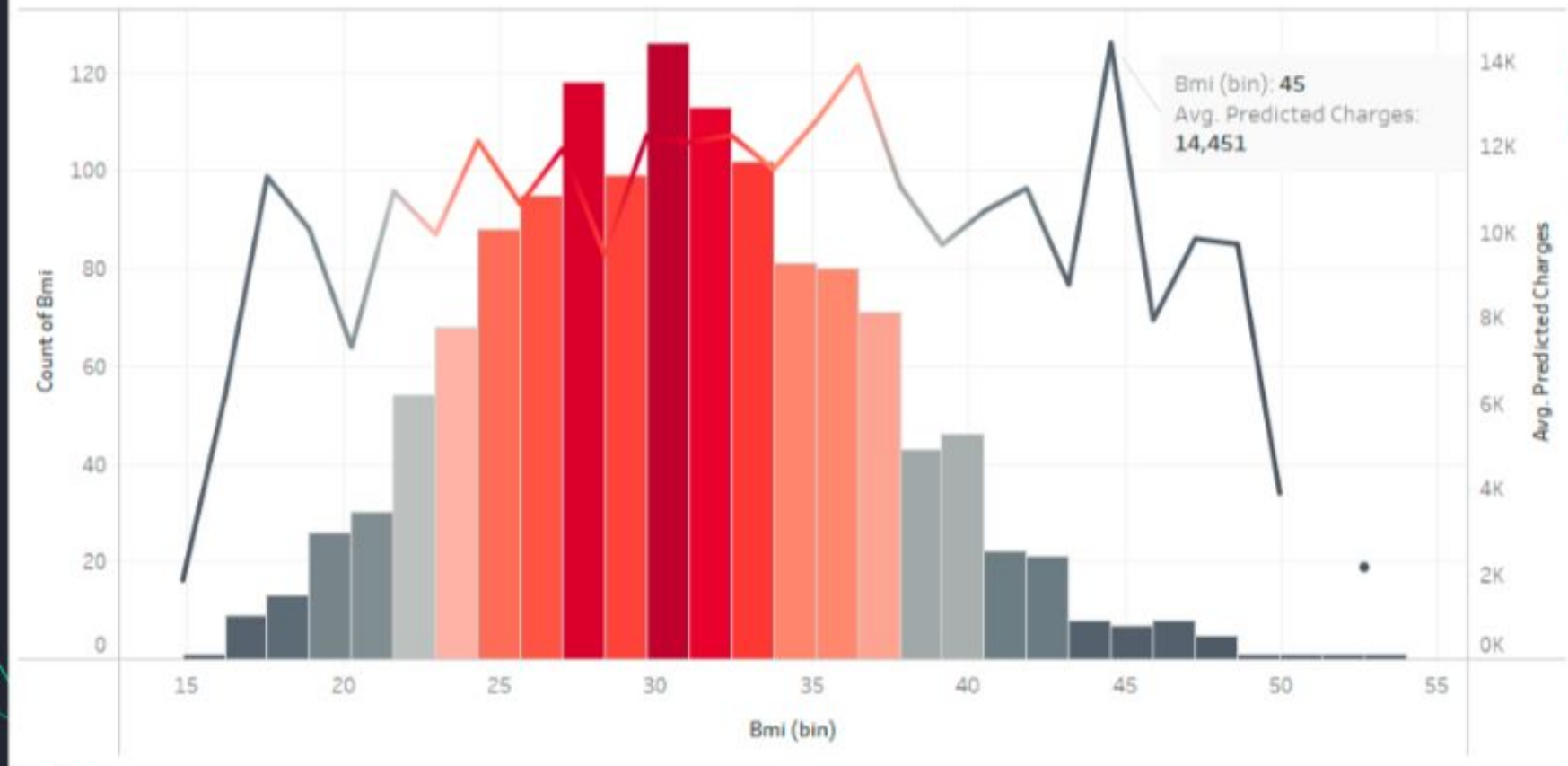
BUSINESS BEHAVIOUR



Insurance companies determine granting coverage to a person based on their medical history, current health status and other risk factors.



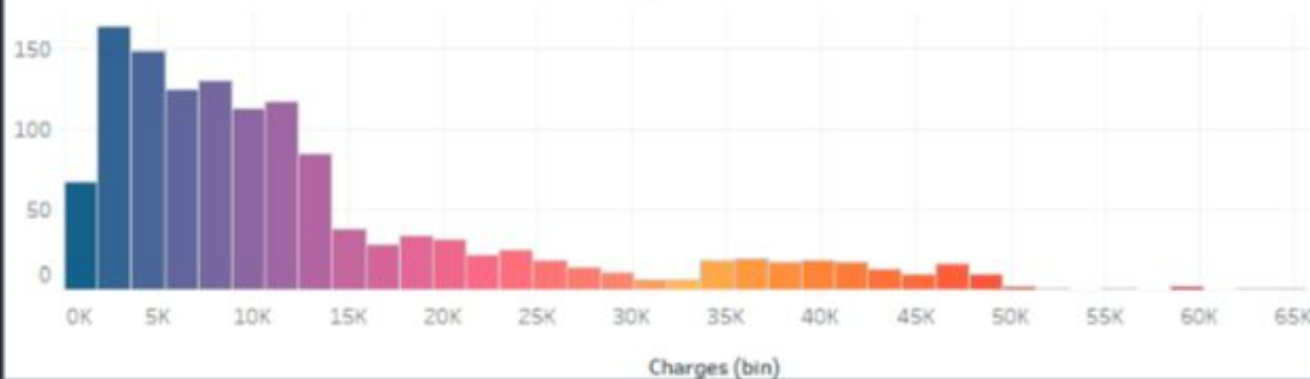
PREDICTED CHARGES WITH RESPECT TO BMI



Capturing health vitals from customers during a health insurance underwriting process can help insurance companies increase profits by reducing risk and saving time.



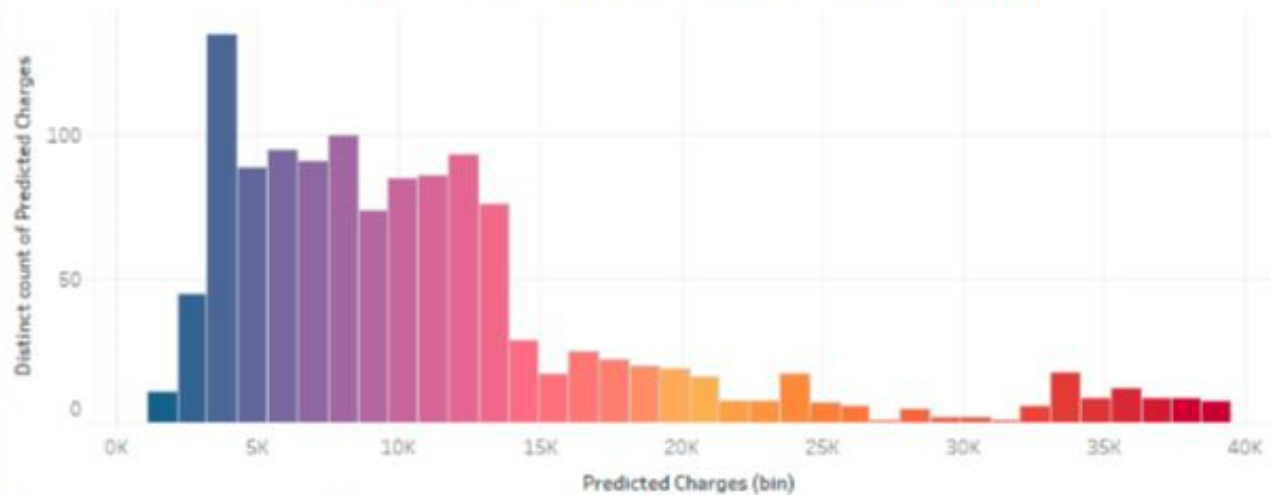
Premium Charges Distribution



AVERAGE PREMIUM CHARGES WITH RESPECT TO SMOKER/ NON SMOKER



Predicted Premium Charges Distribution



One of the greatest fears is getting stuck with a risk that costs more to cover than it pays out in claims.



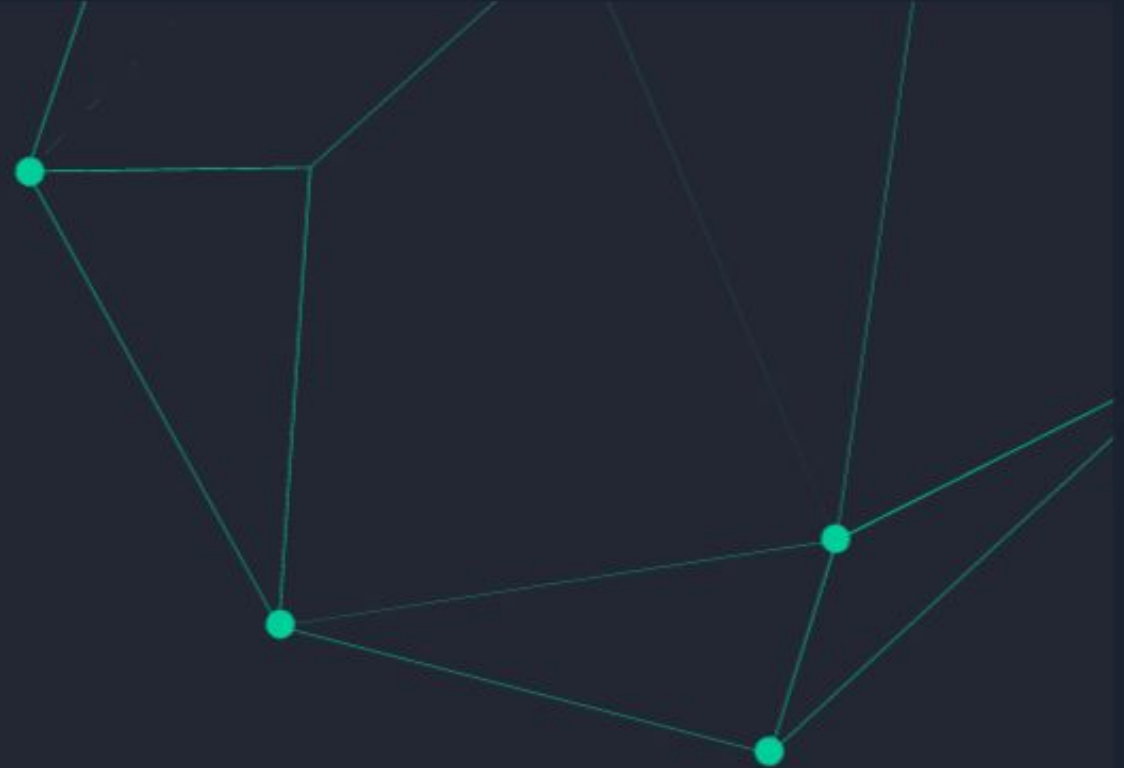
BUSINESS SOLUTIONS AND PREDICTIONS

If a health incident occurs, it can be financially catastrophic for an individual and their family, with massive amounts of money being spent on hospital bills, rehabilitation, and medications.

1. Reducing health underwriting risk helps increase profits in two ways:

- Giving more accurate information about customers' risks, makes insurance companies appear more trustworthy to potential customers.
- Total premium charges must justify the whole business accurately, this will lead to increased sales in future years as premium-paying existing customers continue with the organization

	age	sex	bmi	classif	children	smoker	region	charges	Predicted_Charges
0	19	female	27.900	PREO	0	yes	southwest	16884.92400	16740.791420
1	18	male	33.770	OB1	1	no	southeast	1725.55230	3973.835524
2	28	male	33.000	OB1	3	no	southeast	4449.46200	5776.621874
3	0	male	22.705	N	0	no	northwest	21984.47061	18521.301835



Thank you!

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