Prediction for the diamond price

	RMSE	MAE	R2squared	Relative RMSE
Multiple linear regression	129.76326	4704.8459	0.6155485	1.8784321
Polynomial linear regression	125.5500	2784.93	0.66306	1.8159
Random forest	101.16184	1300.78958	0.85250	1.464402
XGBoost	96.53491	1319.377	0.87769	1.3974

Prediction for the carat_weight

	RMSE	MAE	R2squared	Relative RMSE
Multiple linear regression	0.5686336	0.1278270	0.855766	75.2981451
Polynomial linear regression	0.5900	0.1452	0.83333	78.06
Random forest	0.359079	0.02220	0.977331	47.549095
XGBoost	0.27228	0.02125	0.99250	36.056

Observations and Learnings:

- From the above table we conclude that when we compare the linear and polynomial regression so polynomial regression is best for the given data set because for the given data the value calculated(RMSE,MAE,R2_squared,relative RMSE) for the polynomial regression is best as compared to linear regression.
- For the polynomial regression model we calculated the values for many degrees but we find the best value for degree = 2.
- Further we observed that random forest is best as compared to polynomial regression because in random forest for every feature it obtain many decision tree and from the above decision tree it obtain the optimal value so that the value we got in the random forest is best as compared to the polynomial regression
- At last when we compared about the random forest and XGboost so XGboost is an ensemble learning based model so it obtain the best value among all the model we performed.

NOTE:
Problem 1. Predicting the sales price of diamonds from other given features.

Problem 2: predicting the carat weight of diamonds from other given features.

Contribution as per tasks:

EDA: Aditya, Dhyey, Keyur, Palak, Harshil
XGBoost - Aditya
Multiple Linear Regression- Dhyey
Random Forest- Keyur
Polynomial Regression- Palak
Decision Tree Regression- Harshil