# Multiple Linear Regression (Module -7)

**Problem Statement: -**

Officeworks, is a leading retail store in Australia, with numerous outlets around the country. The manager would like to improve their customer experience by providing them online predictive prices about their gadgets/ Laptops if they wants to sell them. To improve this experience the manager would like us to build a model which is sustainable and accurate enough, to get the objective achieved. Apply multilinear model on the dataset and predict Price, given other attributes and tabulate R squared ,RMSE and correlation values.

Solution:

There are five basic steps when you’re implementing Multiple linear regression:

1. Import the packages and classes you need.
2. Provide data to work with and eventually do appropriate transformations.
3. Create a regression model and fit it with existing data.
4. Check for collinearity between independent variables and between independent and dependent variables .
5. Check for overfitting issue
6. Apply the model for predictions.

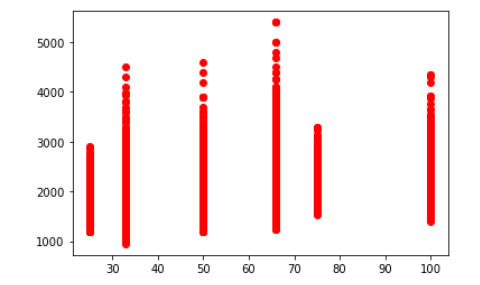
The first step is to import the package numpy and

import numpy as np

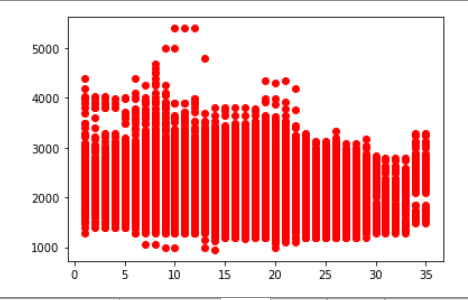
Now, you have all the functionalities you need to implement linear regression.

relavancy check of dependent variable with independent variables by scatter plot

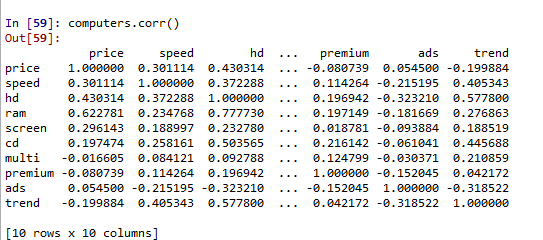
#scatterplot speed vs price



#scatterplot administration trend vs price

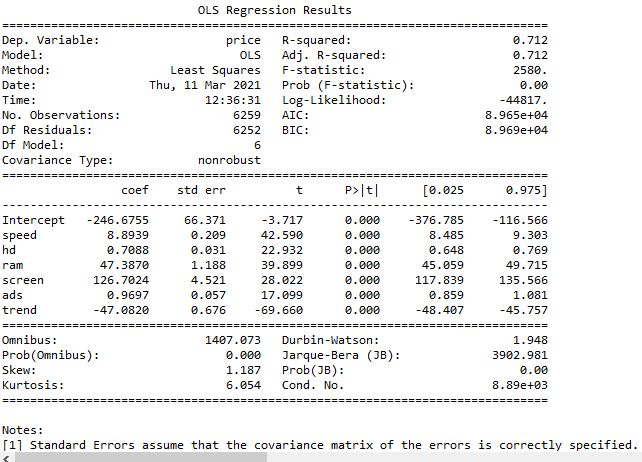


correlation between variables is obtained by correlation matrix



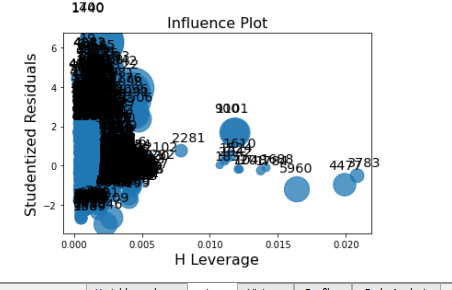
The class statsmodel.formula.api  will be used to perform linear regression and make predictions accordingly.





from statsmodels.api import sm

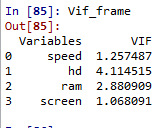
influence\_plot is plotted for model



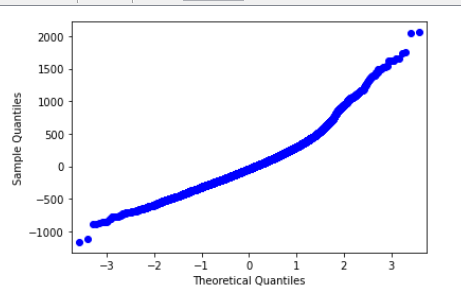
Check for Colinearity to decide to remove a variable using VIF

Assumption: VIF > 10 = colinearity

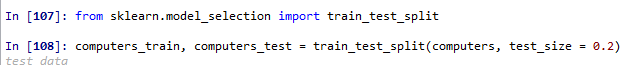
calculating VIF's values of independent variables



QQ plot is plotted for residuals



Data is splitted in to test and train with 20% test data



RMSE value for test data is obtained by

