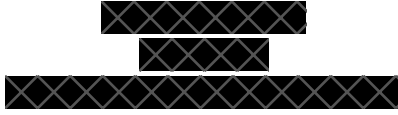


COMP40370 Practical 5



November 2020

Question 1

We Create a simple Linear Regression Model in python with the following: where X is our predictor variables and y is our response variables

```
1 from sklearn.linear_model import LinearRegression
2 reg = LinearRegression()
3 reg = reg.fit(X, y)
```

Question 2

When we Create our Simple Linear Regression Model we see that our coefficient (slope a.k.a β_1) is equal to .6788235294117649 and our Intercept (β_0) is equal to 18.91029411764704 so our model is described by the equation

$$y = 18.91029411764704 + 0.6788235294117649x$$

Question 3

To create polynomial regression models in python we need to first do polynomial transformation to our predictor variables and then pass the transformed variables to a linear model.

Below is an Example of the code for a Polynomial Model of Degree DEG :

```
1 from sklearn.linear_model import LinearRegression
2 from sklearn.preprocessing import PolynomialFeatures
3 poly_feat = PolynomialFeatures(degree=DEG)
4 X_poly = poly_feat.fit_transform(X, y)
5 poly_reg = LinearRegression().fit(X_poly, y)
```

Question 4

I saved the results from all the models

Question 5

Redo all the the previous steps using the data for MCQ2. The linear model was described by

$$y = 29.202312138728338 + 0.6046242774566472x$$

Question 6

We now create a linear model using the Data from Both MCQ1 and MCQ2. This process is the same as creating a linear model in Question1 Model Parameters:

$Intercept = 15.454411944682413$

$Coefficient_1 = 0.587981887161914$

$Coefficient_2 = 0.15599069881287486$

Complimentary Question

