Birla Institute of Technology and Science
Machine Learning
Lab Sheet #4

Learning Outcome:

a) Linear Regression: Curve Fitting

Suppose we have the following dataset ("b" the response variable and "a" the predictor variable)

```
a <- c(34,66,98,120,130, 146,154.5,160)
b <- c(99.5,104.8,108.5,100,86,64,35.3,15)
```

Plot the above dataset using

>plot(a, b, pch = 19) #pch indicates symbol to be used.

Observe that instead of fitting a line, it is better to fit a curve for the given dataset. Do the following:

```
f1 <- lm(b~a) #fit first degree polynomial equation
f2 <- lm(b~poly(a,2,raw=TRUE))# Second degree polynomial
#generate range of 50 numbers starting from 30 and ending at 160
xx <- seq(30,160, length=50)
plot(a,b,pch=19,ylim=c(0,150))
lines(xx, predict(f1, data.frame(a=xx)), col="red")
lines(xx, predict(f2, data.frame(a=xx)), col="green")
```

Q1. Now, fit a curve of third and fourth degree.
Q2. Find the coefficients of corresponding equations.
Q3. See the summary of f1 and f2.
Q4. Repeat the above process for cars dataset.
Q5. Repeat the above process for iris dataset.

https://davetang.org/muse/2013/05/09/on-curve-fitting/