Qustion1

PVfunction=function(C,F,yield,n){

#yield=c(interests)

P=0

t<-seq(1/2,n/2,0.5)

for(j in 1:n)

{

P=C\*exp(-yield[j]\*t[j])+P

}

P1<-P+F\*exp(-yield[n]\*t[n])

return(P1)

}

Question2: Summary

Simple linear regression

Simple linear regression assumes a linear relationship between response Y and predictor variable X, which can be written as:

Y ≈ β0 + β1X. we can use the sample data to estimates βˆ0 and βˆ1 by calculating yˆ = βˆ0 + βˆ1x.

Let be the prediction for Y based on the ith value of X, the residual:.

The minimizers are ,

How far off will that single estimate of be? In general, we solve the question by computing the standard error of, written as SE(). We have standard the well-known formula error

Var () = SE()^2 = σ^2/ n

standard errors: SE ()^ 2 =

SE ()^2=

For linear regression, the form of 95% confidence interval of β1 is:

Similarly, β0 has the form

Hypothesis test:

H0 : There is no relationship between X and Y β1 = 0

Ha : There is some relationship between X and Y . β1 0,

t-statistic

Once we rejected H0, we consider which model fits the data. Linear regression uses RSE and R^2 statistic.

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Multiple Linear Regression:

The multiple linear regression model:

We interpret βj as the average effect on Y of a one unit increase in Xj , maintaining all other predictors fixed

We can estimate βˆ0, βˆ1,..., βˆp by using the formular

To check whether there is a relationship between the response and the predictor, we use a hypothesis test:

H0 : β1 = β2 = ··· = βp = 0

Ha : at least one βj is non-zero.

Calculating F statistic:(3.23)

Important Variables:

In order to determine which model best fit the data, we normally use three approaches:

Forward seletion

Backward selection

Mixed selection

Model Fit:

Two most classical approaches of model fit are the RSE and . is the square of the correlation of the variable and the response.

, higher RSE indicates that models have more variables if reduce in RSS is small relative to the increase in p.

Predictions:

After fitting the multiple regression model, we can predict Y on the set of values of X1,X2,…,Xp. Three classification of uncertainty related with the prediction.

Qustion3

1. dataset<-read.csv("singapore.economy.csv",header=T)
2. chan.dataset<-na.omit(dataset)

chan.dataset

(c) plot(x=chan.dataset$time,y=chan.dataset$gdp,main="Singapore GDP growth",xlab='Time',ylab='GDP(%)')

m<-tapply(chan.dataset$gdp,chan.dataset$period,mean)

sd<-tapply(chan.dataset$gdp,chan.dataset$period,sd)

library(data.table)

stat.table<-data.table(m,sd)

stat.table

pairs(chan.dataset[,3:10], pch = 19)

LM<-lm(chan.dataset$gdp~chan.dataset$exp)

summary(LM)

LM1<-lm(chan.dataset$gdp~chan.dataset$exp+chan.dataset$epg+chan.dataset$hpr+chan.dataset$oil+chan.dataset$gdpus+chan.dataset$crd)

summary(LM1)