Mid Semester Practical Exam 1740256

Jeevan

11/09/2019

library(readxl)

## Warning: package 'readxl' was built under R version 3.5.2

data <- read\_excel("C:/Users/Jeevan/Desktop/Christ University/Statistics/Linear Regression/death rate-mid sem practical 2.xlsx")  
# View(data)  
attach(data)  
fullmodel = lm(Y~.,data = data)  
summary(fullmodel)

##   
## Call:  
## lm(formula = Y ~ ., data = data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -5.6404 -0.7904 0.3053 0.9164 2.7906   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 12.2662552 2.0201467 6.072 1.95e-07 \*\*\*  
## X1 0.0073916 0.0069336 1.066 0.2917   
## X2 0.0005837 0.0007219 0.809 0.4228   
## X3 -0.3302302 0.2345518 -1.408 0.1656   
## X4 -0.0094629 0.0048868 -1.936 0.0587 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1.601 on 48 degrees of freedom  
## Multiple R-squared: 0.1437, Adjusted R-squared: 0.07235   
## F-statistic: 2.014 on 4 and 48 DF, p-value: 0.1075

step(fullmodel,direction = "backward")

## Start: AIC=54.65  
## Y ~ X1 + X2 + X3 + X4  
##   
## Df Sum of Sq RSS AIC  
## - X2 1 1.6763 124.75 53.369  
## - X1 1 2.9139 125.99 53.892  
## <none> 123.07 54.652  
## - X3 1 5.0825 128.16 54.797  
## - X4 1 9.6144 132.69 56.639  
##   
## Step: AIC=53.37  
## Y ~ X1 + X3 + X4  
##   
## Df Sum of Sq RSS AIC  
## <none> 124.75 53.369  
## - X1 1 5.1882 129.94 53.529  
## - X3 1 6.1544 130.91 53.921  
## - X4 1 8.3192 133.07 54.791

##   
## Call:  
## lm(formula = Y ~ X1 + X3 + X4, data = data)  
##   
## Coefficients:  
## (Intercept) X1 X3 X4   
## 12.565900 0.009284 -0.359140 -0.008580

be = lm(Y~X1+X2+X3+X4,data = data)  
summary(be)

##   
## Call:  
## lm(formula = Y ~ X1 + X2 + X3 + X4, data = data)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -5.6404 -0.7904 0.3053 0.9164 2.7906   
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## Coefficients:  
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confint(fullmodel,level = 0.95)

## 2.5 % 97.5 %  
## (Intercept) 8.2044779685 1.632803e+01  
## X1 -0.0065494163 2.133265e-02  
## X2 -0.0008677875 2.035219e-03  
## X3 -0.8018281444 1.413677e-01  
## X4 -0.0192884855 3.627158e-04

confint(be,level = 0.95)

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## (Intercept) 8.2044779685 1.632803e+01  
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## X3 -0.8018281444 1.413677e-01  
## X4 -0.0192884855 3.627158e-04

fit\_best = fitted.values(fullmodel)  
fit\_best

## 1 2 3 4 5 6 7   
## 8.972027 8.785975 9.768070 10.164920 8.401402 8.525122 8.486422   
## 8 9 10 11 12 13 14   
## 9.341207 8.771974 9.516408 7.406281 8.700588 9.185219 8.372307   
## 15 16 17 18 19 20 21   
## 9.533879 8.345707 8.922888 8.706957 8.770364 9.233007 10.204736   
## 22 23 24 25 26 27 28   
## 9.862588 10.031174 8.820786 9.094704 9.768036 9.333990 8.998103   
## 29 30 31 32 33 34 35   
## 10.268026 8.981212 8.969487 9.507752 9.545355 9.634755 9.361534   
## 36 37 38 39 40 41 42   
## 10.290094 8.540195 10.047817 8.755423 9.721895 9.500673 9.664476   
## 43 44 45 46 47 48 49   
## 9.240410 9.950695 9.883561 8.690609 9.790375 9.481179 10.501729   
## 50 51 52 53   
## 10.063890 10.009360 9.304791 9.469863

sum(fit\_best)

## [1] 493.2

sum(Y)

## [1] 493.2

fit = fitted.values(be)  
fit

## 1 2 3 4 5 6 7   
## 8.972027 8.785975 9.768070 10.164920 8.401402 8.525122 8.486422   
## 8 9 10 11 12 13 14   
## 9.341207 8.771974 9.516408 7.406281 8.700588 9.185219 8.372307   
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## 50 51 52 53   
## 10.063890 10.009360 9.304791 9.469863

sum(Y)

## [1] 493.2

sum(fit)

## [1] 493.2

summary(be)$adj.r.squared

## [1] 0.07234595