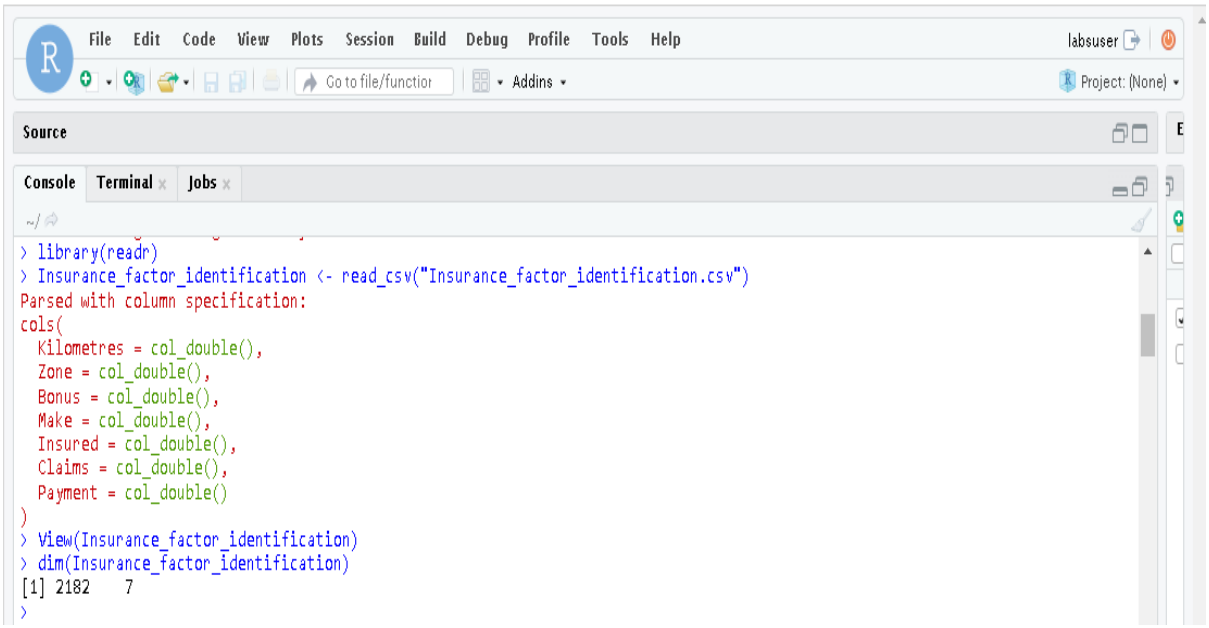
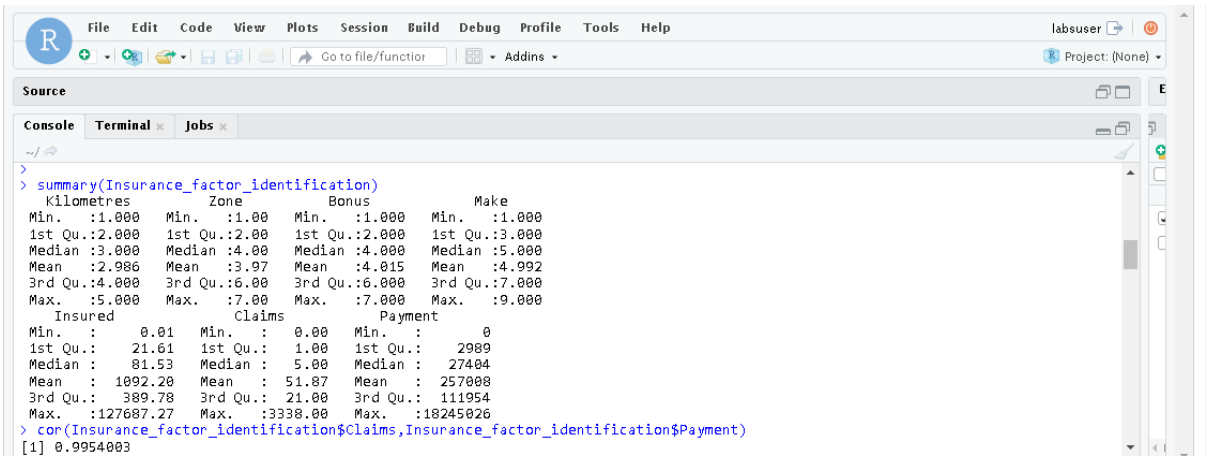
Data Science with R Insurance Project

By Mpho Tsotetsi

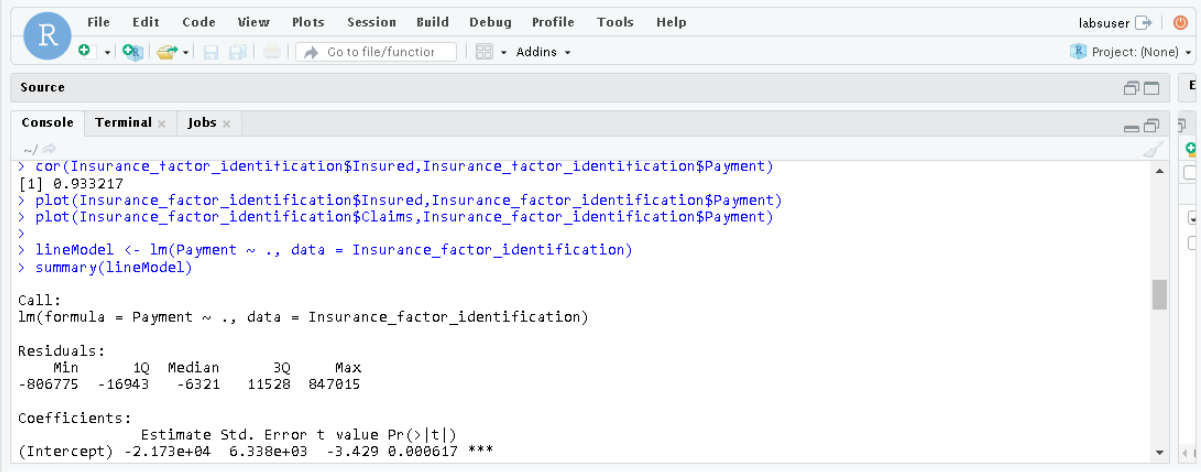
Loading the data



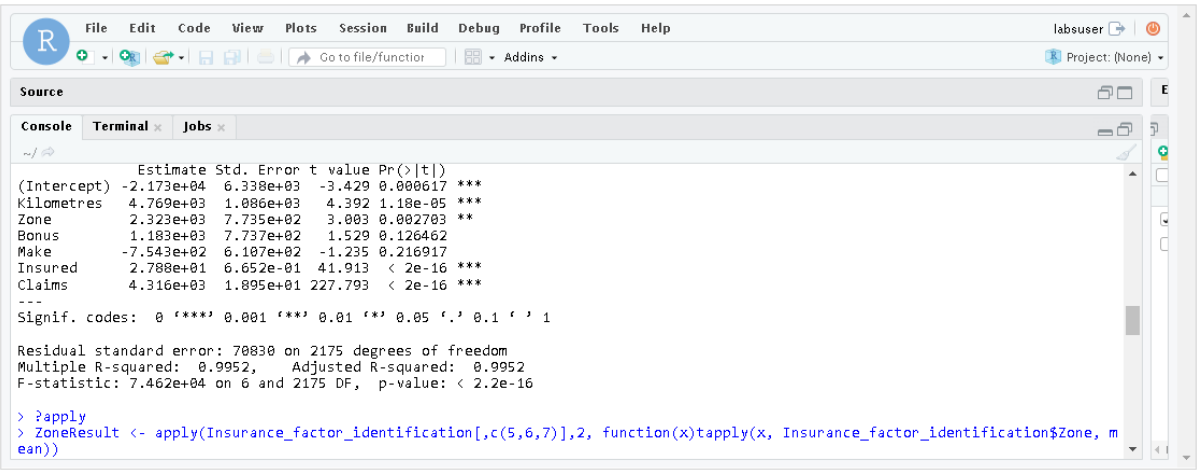


1.Interpretation of the results:

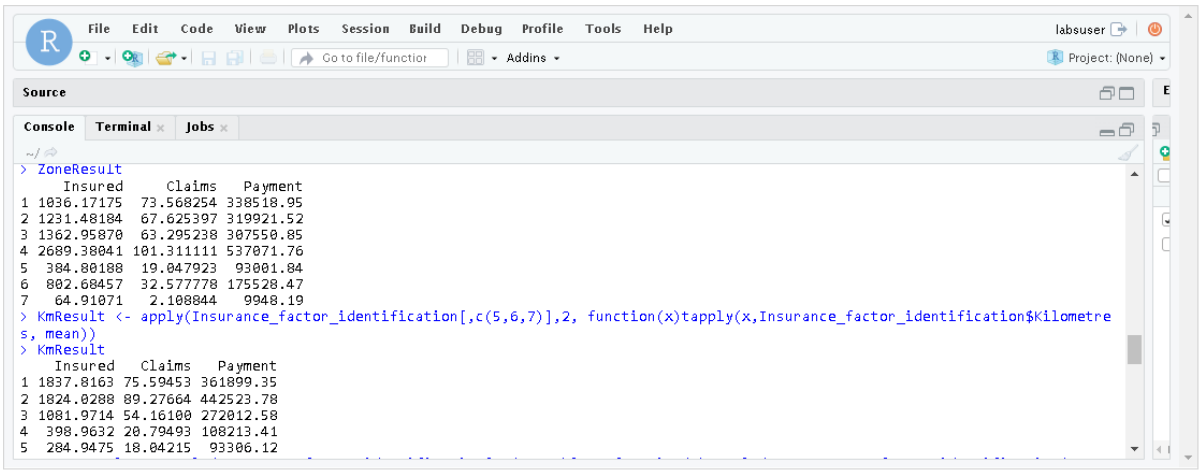
The result gives 5 point summary of each column of the data. This gives the spread of data.There are some 0 values in Claims and Payment though the car has been Insured. This means no Claim or Payment has been made for that datapoint(s)



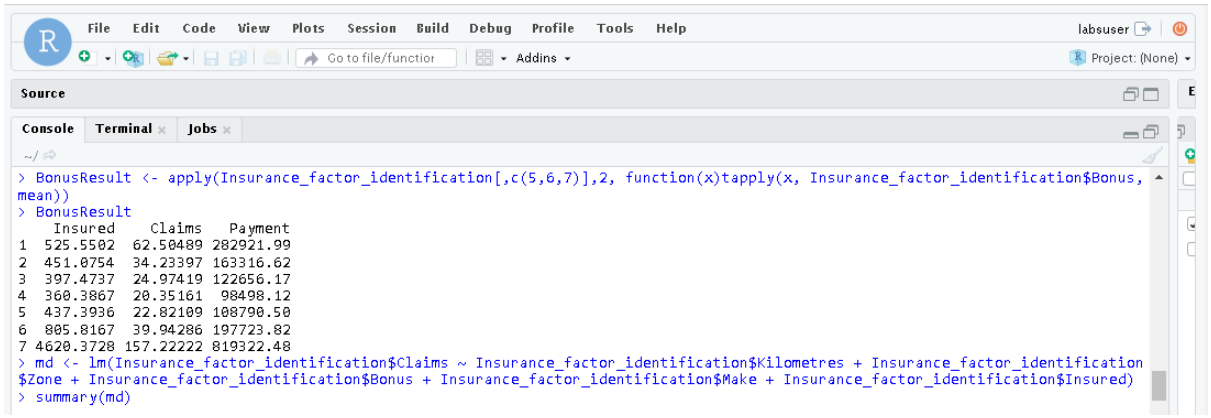
```
> cor(Insurance_factor_identification$Insured,Insurance_factor_identification$Payment)
[1] 0.933217
> plot(Insurance_factor_identification$Insured,Insurance_factor_identification$Payment)
> plot(Insurance_factor_identification$Claims,Insurance_factor_identification$Payment)
>
> lineModel <- lm(Payment ~ ., data = Insurance_factor_identification)
> summary(lineModel)

Call:
lm(formula = Payment ~ ., data = Insurance_factor_identification)

Residuals:
    Min      1Q  Median      3Q     Max
-806775 -16943   -6321   11528  847015

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -2.173e+04  6.338e+03  -3.429 0.000617 ***
```

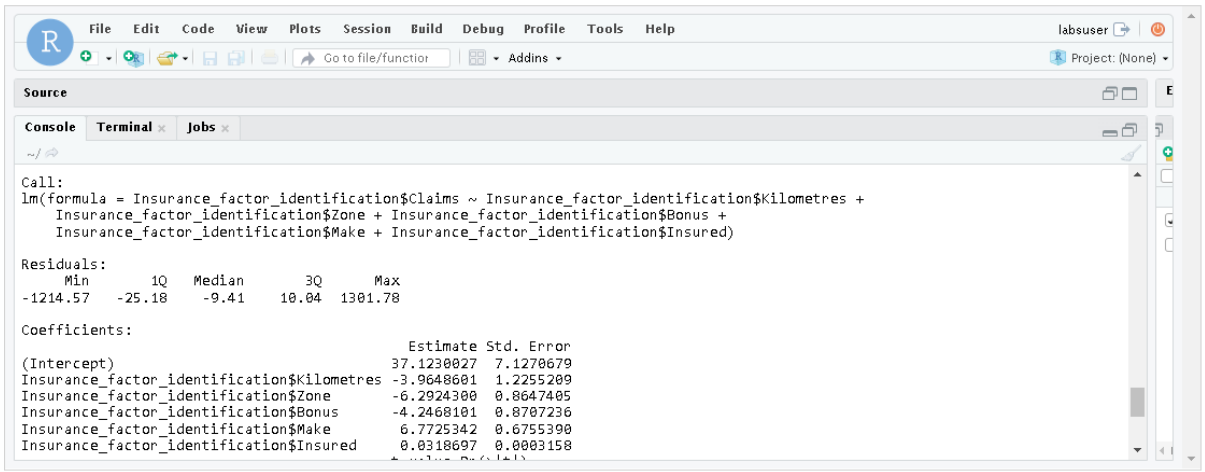


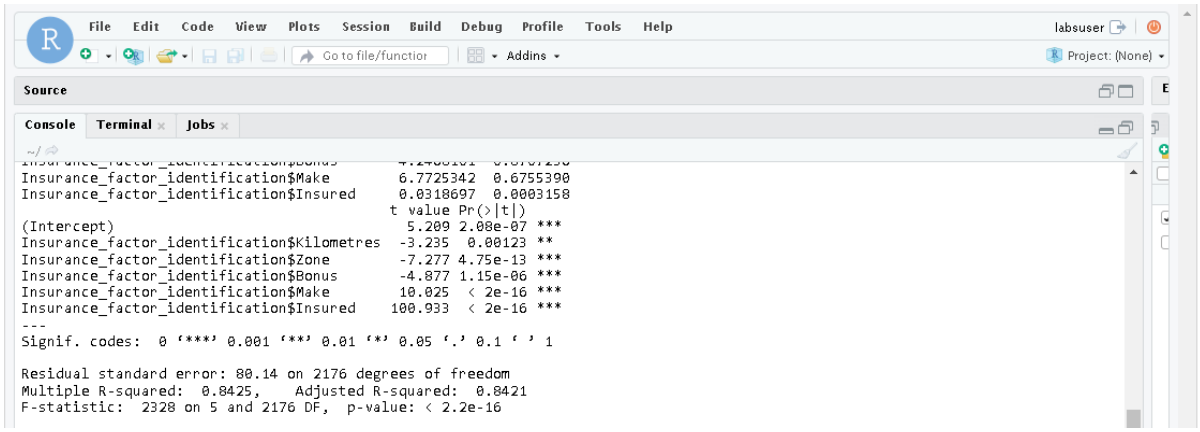
```
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -2.173e+04  6.338e+03  -3.429 0.000617 ***
Kilometres   4.769e+03  1.086e+03   4.392 1.18e-05 ***
Zone         2.323e+03  7.735e+02   3.003 0.002703 **
Bonus        1.183e+03  7.737e+02   1.529 0.126462
Make        -7.543e+02  6.107e+02  -1.235 0.216917
Insured      2.788e+01  6.652e-01  41.913  < 2e-16 ***
Claims       4.316e+03  1.895e+01 227.793  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 70830 on 2175 degrees of freedom
Multiple R-squared:  0.9952,    Adjusted R-squared:  0.9952
F-statistic: 7.462e+04 on 6 and 2175 DF,  p-value: < 2.2e-16

> ?apply
> ZoneResult <- apply(Insurance_factor_identification[,c(5,6,7)],2, function(x)tapply(x, Insurance_factor_identification$Zone, m
ean))
```



```
> ZoneResult
     Insured     Claims   Payment
1 1036.17175  73.568254 338518.95
2 1231.48184  67.625397 319921.52
3 1362.95870  63.295238 307550.85
4 2689.38041 101.311111 537071.76
5  384.80188  19.047923  93001.84
6  802.68457  32.577778 175528.47
7   64.91071   2.108844   9948.19
> KmResult <- apply(Insurance_factor_identification[,c(5,6,7)],2, function(x)tapply(x,Insurance_factor_identification$Kilometre
s, mean))
> KmResult
    Insured   Claims    Payment
1 1837.8163 75.59453 361899.35
2 1824.0288 89.27664 442523.78
3 1081.9714 54.16100 272012.58
4  398.9632 20.79493 108213.41
5  284.9475 18.04215  93306.12
```


File Edit Code View Plots Session Build Debug Profile Tools Help
labsuser
Addins
Project: (None)
Source
Console Terminal Jobs
> BonusResult <- apply(Insurance_factor_identification[,c(5,6,7)],2, function(x)tapply(x, Insurance_factor_identification$Bonus, mean))
> BonusResult
Insured Claims Payment
1 525.5502 62.50489 282921.99
2 451.0754 34.23397 163316.62
3 397.4737 24.97419 122656.17
4 360.3867 20.35161 98498.12
5 437.3936 22.82109 108790.50
6 805.8167 39.94286 197723.82
7 4620.3728 157.22222 819322.48
> md <- lm(Insurance_factor_identification$Claims ~ Insurance_factor_identification$Kilometres + Insurance_factor_identification$Zone + Insurance_factor_identification$Bonus + Insurance_factor_identification$Make + Insurance_factor_identification$Insured)
> summary(md)


File Edit Code View Plots Session Build Debug Profile Tools Help
labsuser
Addins
Project: (None)
Source
Console Terminal Jobs
Call:
lm(formula = Insurance_factor_identification$Claims ~ Insurance_factor_identification$Kilometres + Insurance_factor_identification$Zone + Insurance_factor_identification$Bonus + Insurance_factor_identification$Make + Insurance_factor_identification$Insured)
Residuals:
Min 1Q Median 3Q Max
-1214.57 -25.18 -9.41 10.04 1301.78
Coefficients:
Estimate Std. Error
(Intercept) 37.1230027 7.1270679
Insurance_factor_identification$Kilometres -3.9648601 1.2255209
Insurance_factor_identification$Zone -6.2924300 0.8647405
Insurance_factor_identification$Bonus -4.2468101 0.8707236
Insurance_factor_identification$Make 6.7725342 0.6755390
Insurance_factor_identification$Insured 0.0318697 0.0003158


File Edit Code View Plots Session Build Debug Profile Tools Help
labsuser
Addins
Project: (None)
Source
Console Terminal Jobs
Insurance_factor_identification$Make 6.7725342 0.6755390
Insurance_factor_identification$Insured 0.0318697 0.0003158
t value Pr(>|t|)
(Intercept) 5.209 2.08e-07 ***
Insurance_factor_identification$Kilometres -3.235 0.00123 **
Insurance_factor_identification$Zone -7.277 4.75e-13 ***
Insurance_factor_identification$Bonus -4.877 1.15e-06 ***
Insurance_factor_identification$Make 10.025 < 2e-16 ***
Insurance_factor_identification$Insured 100.933 < 2e-16 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
Residual standard error: 80.14 on 2176 degrees of freedom
Multiple R-squared: 0.8425, Adjusted R-squared: 0.8421
F-statistic: 2328 on 5 and 2176 DF, p-value: < 2.2e-16