Rlab 4

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1. Do one statistical test that is meaningful to you. Explain your results.

研究家戶持有的車輛數對於居住在都市或鄉村是否有差異

選取 CNTTDHH 和 URBRUR 作為變數進行 t-test

結果可知 居住在都市及居住在鄉村所持有的車輛數有顯著差異(p-value<0.05)

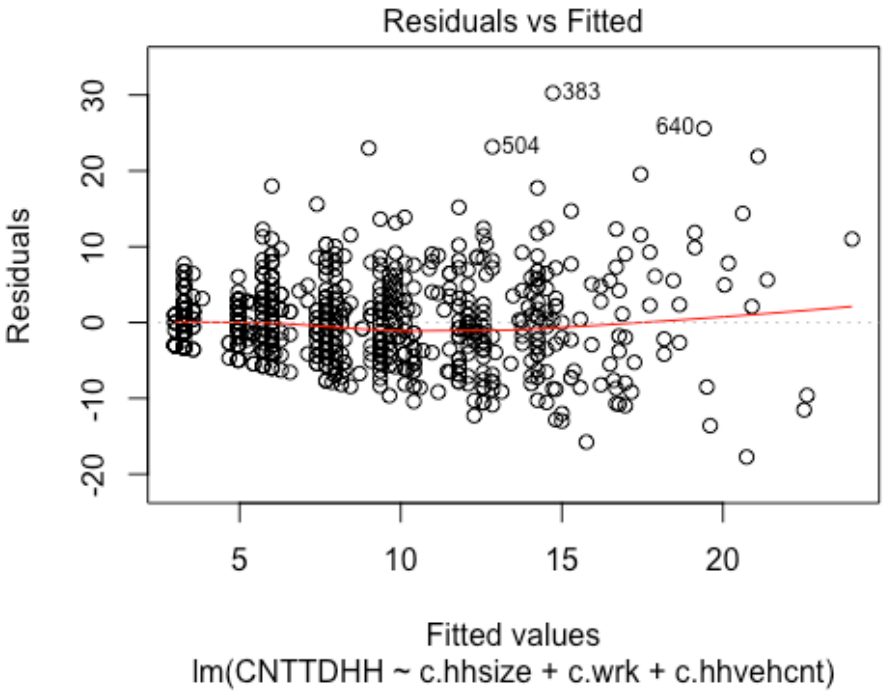
```
> t.test(test.il$CNTTDHH,test.il$URBRUR)

        Welch Two Sample t-test

data:  test.il$CNTTDHH and test.il$URBRUR
t = 30.412, df = 812.96, p-value < 2.2e-16
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 6.880057 7.829461
sample estimates:
mean of x mean of y
 8.530284  1.175525
```

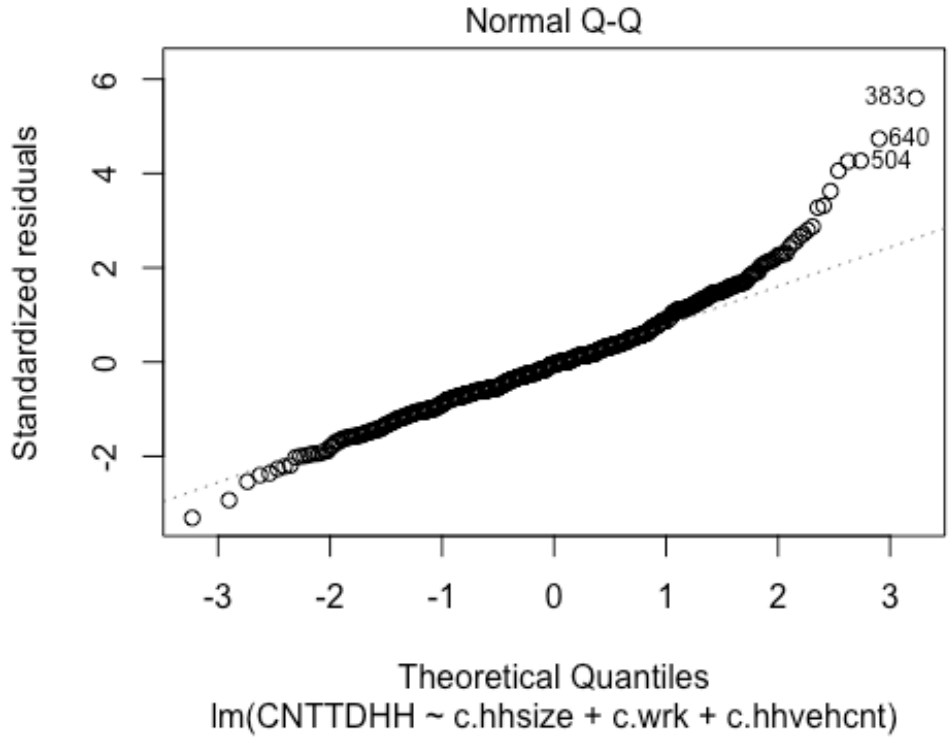
2. Develop a regression model and report it.

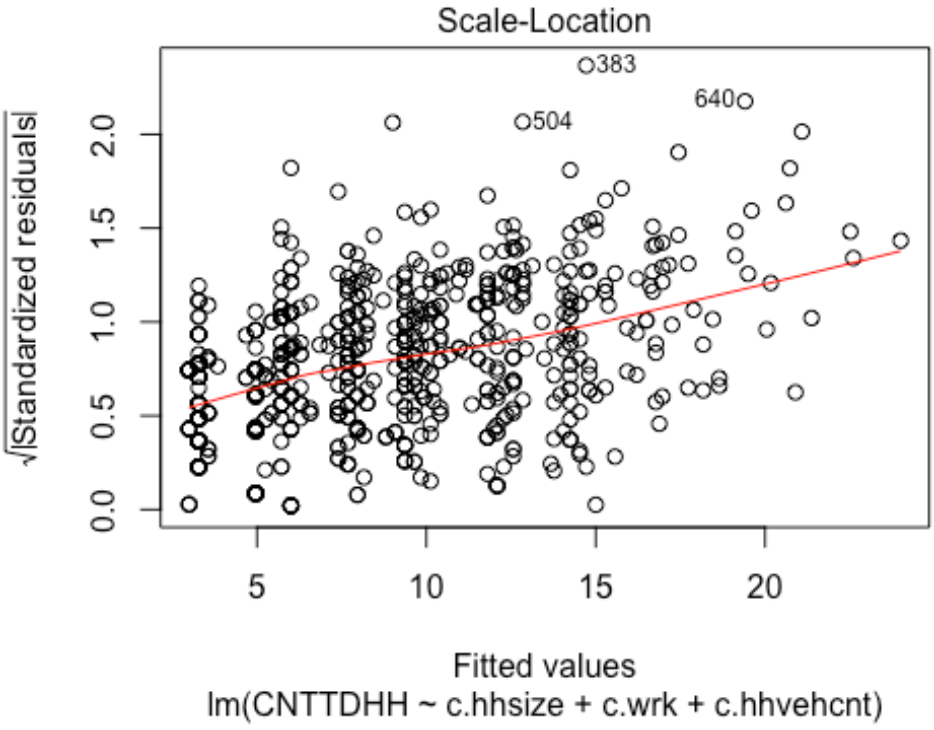
Regression model: y=8.5303+2.44*c.hhsize+1.6811*c.wrk+0.2833*c.hhvehcnt

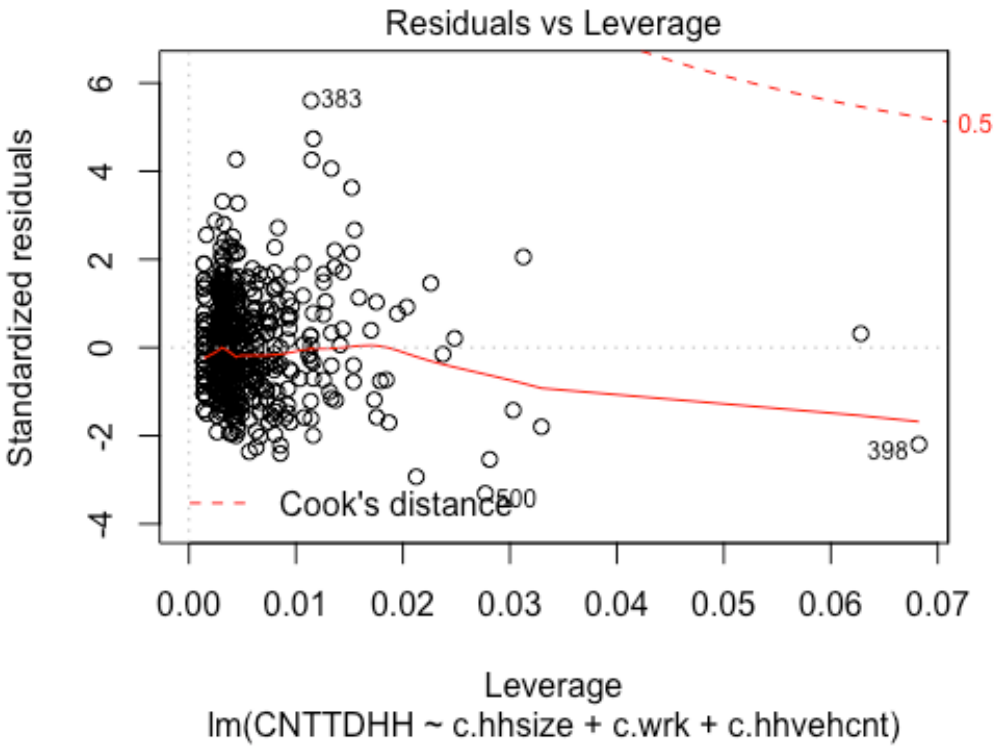
選擇 HH size, number of workers in HH, count of HH vehicles 作為解釋變數並且標準化過，對 number of HH trips 做迴歸。因為認為家戶數、工作人數及車輛數可能會使旅次數增加，透過迴歸發現只有家戶數及工作人數有顯著的影響(p-value<0.05)，車輛數反而影響不大(p-value>0.05)。

```
> reg.il.1 <- lm(CNTTDHH~c.hhsize+c.wrk+c.hhvehcnt, data=data.il)
> summary(reg.il.1,digits=3)

Call:
lm(formula = CNTTDHH ~ c.hhsize + c.wrk + c.hhvehcnt, data = data.il)

Residuals:
     Min       1Q   Median       3Q      Max
-17.7333  -3.3647  -0.2792   2.7208  30.2797

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   8.5303     0.1911  44.632  < 2e-16 ***
c.hhsize      2.4400     0.1780  13.706  < 2e-16 ***
c.wrk         1.6811     0.2566   6.553 1.01e-10 ***
c.hhvehcnt    0.2833     0.1981   1.430    0.153
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 5.436 on 805 degrees of freedom
Multiple R-squared:  0.3758,    Adjusted R-squared:  0.3735
F-statistic: 161.6 on 3 and 805 DF,  p-value: < 2.2e-16
```




Normal Q-Q
Standardized residuals
383
640
504
-2
0
2
4
6
-3
-2
-1
0
1
2
3
Theoretical Quantiles
lm(CNTTDHH ~ c.hhsize + c.wrk + c.hhvehcnt)


Scale-Location
√|Standardized residuals|
383
640
504
0.0
0.5
1.0
1.5
2.0
5
10
15
20
Fitted values
lm(CNTTDHH ~ c.hhsize + c.wrk + c.hhvehcnt)


Residuals vs Leverage
Standardized residuals
Leverage
lm(CNTTDHH ~ c.hhsize + c.wrk + c.hhvehcnt)
Cook's distance
0.5
383
398
500
6
4
2
0
-2
-4
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07