Multiple Linear Regression

In Multiple linear regression more than one predictor variables are used to predict the response variable

Multiple Linear Regression

Relationship for Multiple linear regression can be written as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_p X_p + \epsilon,$$

β_0 is known as Intercept
p is the number of predictors
ϵ is an error term

For our Model,
The equation is

$$Price = \beta_0 + \beta_1 \, Crime\_rate + \beta_2 poor\_pop \ldots \ldots \beta_{16} avg\_dist$$

Multiple Linear Regression

Estimating Regression Coefficients

$$\text{RSS} = \sum_{i=1}^{n}(y_i - \hat{y}_i)^2$$

```
Coefficients:
                          Estimate Std. Error t value Pr(>|t|)
(Intercept)              -6.498625   5.264076  -1.235   0.2176
crime_rate                0.009710   0.348185   0.028   0.9778
resid_area               -0.040875   0.057585  -0.710   0.4782
air_qual                -15.897400   4.003793  -3.971 8.24e-05 ***
room_num                  4.019017   0.426606   9.421  < 2e-16 ***
age                      -0.005715   0.013606  -0.420   0.6747
teachers                  1.007001   0.122098   8.247 1.50e-15 ***
poor_prop                -0.577271   0.052695 -10.955  < 2e-16 ***
airportYES                1.131516   0.454266   2.491   0.0131 *
n_hos_beds                0.329221   0.152239   2.163   0.0311 *
n_hot_rooms               0.091868   0.082174   1.118   0.2641
waterbodyLake             0.264086   0.641963   0.411   0.6810
`waterbodyLake and River` -0.687556   0.714023  -0.963   0.3361
waterbodyRiver           -0.291319   0.546656  -0.533   0.5943
rainfall                  0.016119   0.017839   0.904   0.3667
avg_dist                 -1.218640   0.188933  -6.450 2.68e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.925 on 490 degrees of freedom
Multiple R-squared:  0.7208,    Adjusted R-squared:  0.7123
F-statistic: 84.34 on 15 and 490 DF,  p-value: < 2.2e-16
```