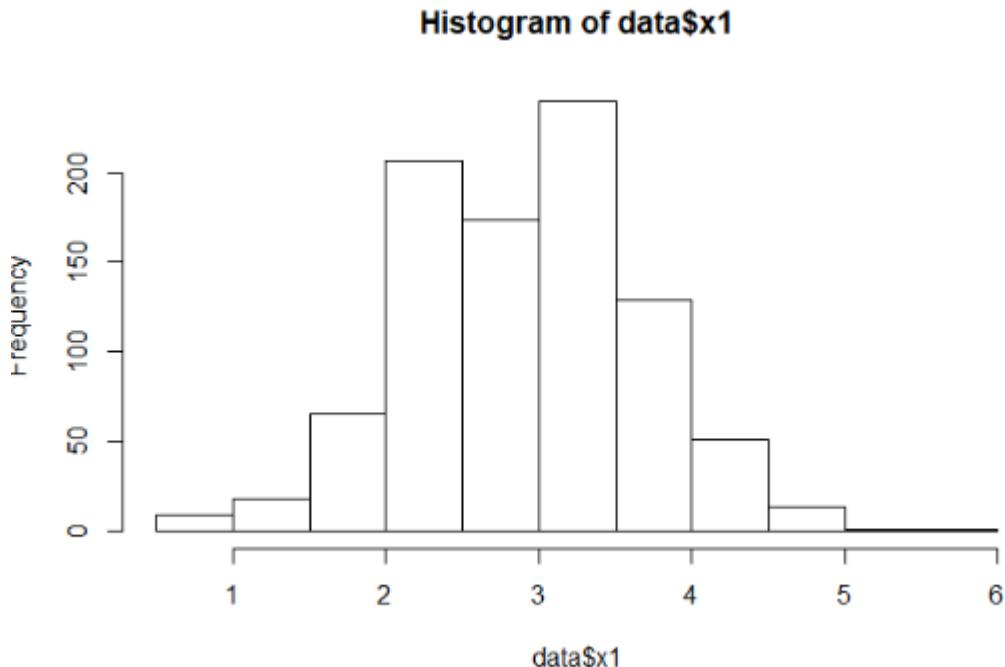


## ML-HW2

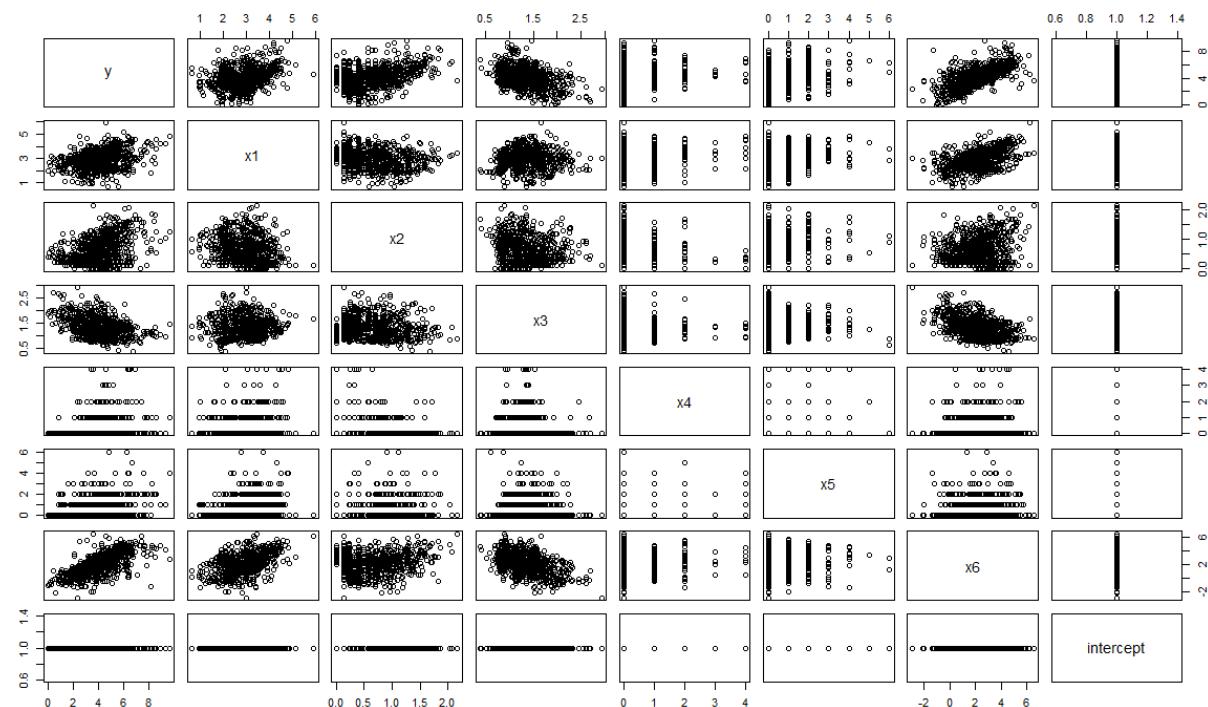
### Problem 7: Programming: prediction of acute aquatic toxicity

(a) explore the data.

```
> hist(data$x1)
```



```
> pairs(data)
```



**(b) implement the analytical solution to multiple linear regression and compare the obtained estimates with those of the built-in function lm in R.**

```
>fit <- lm(y ~ x1 + x2 + x3 + x4 + x5 + x6 , toxicity_data)

##Coefficients:
(Intercept)          x1          x2          x3          x4          x5          x6
  2.17456      0.38563     1.25562    -0.74641     0.41355     0.06433    0.39005
```

lm : a function for Fitting Linear Models in R

**AS\_MLR:** My analytical function for Fitting multiple Linear Models in R

```
> AS_MLR(data)
[ ,1]
x1      0.38562621
x2      1.25562193
x3     -0.74641356
x4      0.41355009
x5      0.06433409
x6      0.39005251
intercept 2.17456016
```

(c) compare cross validation errors of KNN and multiple linear regression on the above dataset.

```
>CV_error_KNN(data,5,1)
[1] 1.342034
> CV_error_MLR(data,5)
[1] 0.6894322
```

CV\_error\_MLR > CV\_error\_KNN