STAT_37810_Week3_Pair

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5

6

```
data(mtcars)
head(mtcars)
```

```
##                   mpg cyl disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4         21.0   6  160 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag     21.0   6  160 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710        22.8   4  108  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive    21.4   6  258 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0    3    2
## Valiant           18.1   6  225 105 2.76 3.460 20.22  1  0    3    1
```

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Row number of Datsun 710 is 3.
Column number of number of cylinder is 2.
The number of cylinder for Datsun 710 is 4.

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```
which(rownames(mtcars)=="Datsun 710")#Datsun 710's row number
```

```
## [1] 3
```

```
which(colnames(mtcars)=="cyl") #Number of cylinders's column number
```

```
## [1] 2
```

```
mtcars[which(rownames(mtcars)=="Datsun 710"),which(colnames(mtcars)=="cyl")]
```

```
## [1] 4
```

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```
nrow(mtcars)# number of row
```

```
## [1] 32
```

```r
ncol(mtcars)# number of column
```

```
## [1] 11
```

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```r
mtcars[["mpg"]]
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2
## [15] 10.4 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4
## [29] 15.8 19.7 15.0 21.4
```

```r
mtcars[[1]]
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2
## [15] 10.4 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4
## [29] 15.8 19.7 15.0 21.4
```

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```r
mtcars$mpg
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2
## [15] 10.4 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4
## [29] 15.8 19.7 15.0 21.4
```

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```r
mtcars[,"mpg"]
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2
## [15] 10.4 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4
## [29] 15.8 19.7 15.0 21.4
```

```r
mtcars[,c("mpg","hp")]
```

```
##                      mpg  hp
## Mazda RX4           21.0 110
## Mazda RX4 Wag       21.0 110
## Datsun 710          22.8  93
## Hornet 4 Drive      21.4 110
## Hornet Sportabout   18.7 175
## Valiant             18.1 105
## Duster 360          14.3 245
## Merc 240D           24.4  62
## Merc 230            22.8  95
## Merc 280            19.2 123
## Merc 280C           17.8 123
## Merc 450SE          16.4 180
## Merc 450SL          17.3 180
## Merc 450SLC         15.2 180
## Cadillac Fleetwood  10.4 205
```

```
## Lincoln Continental 10.4 215
## Chrysler Imperial   14.7 230
## Fiat 128            32.4  66
## Honda Civic         30.4  52
## Toyota Corolla      33.9  65
## Toyota Corona       21.5  97
## Dodge Challenger    15.5 150
## AMC Javelin         15.2 150
## Camaro Z28          13.3 245
## Pontiac Firebird    19.2 175
## Fiat X1-9           27.3  66
## Porsche 914-2       26.0  91
## Lotus Europa        30.4 113
## Ford Pantera L      15.8 264
## Ferrari Dino        19.7 175
## Maserati Bora       15.0 335
## Volvo 142E          21.4 109
```

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```
mean(mtcars$mpg)
```

```
## [1] 20.09062
```

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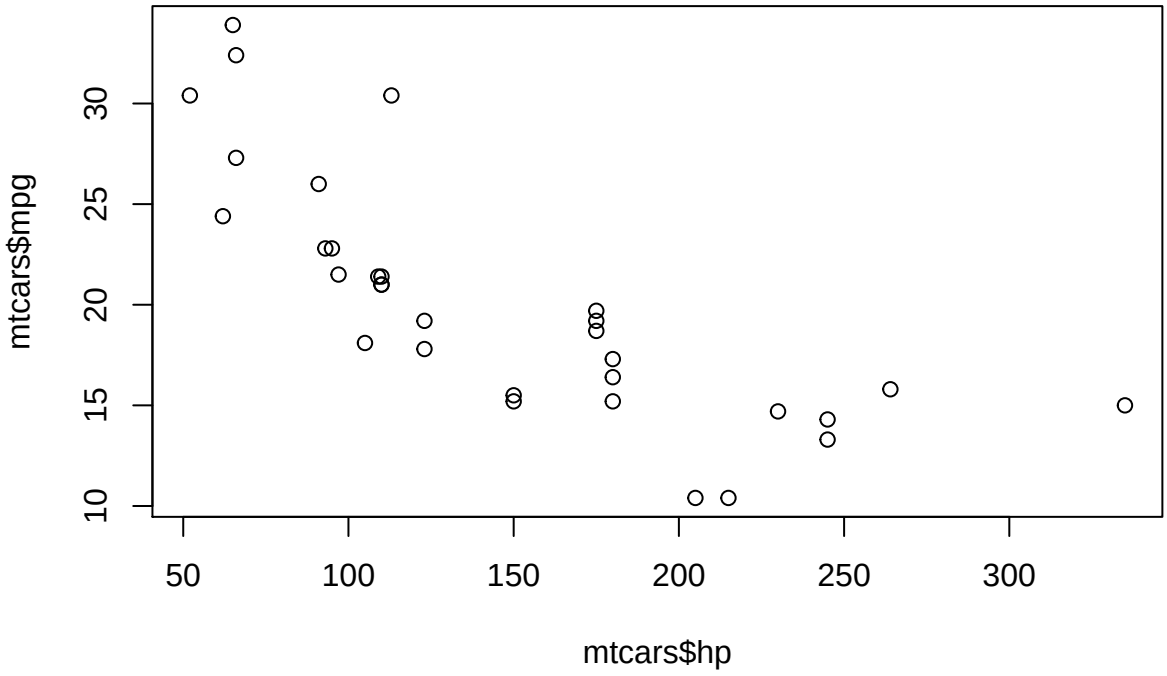
```
plot(mtcars$hp,mtcars$mpg)
```



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```r
fit <- lm(mpg~hp,data=mtcars)
summary(fit)
```

```
##
## Call:
## lm(formula = mpg ~ hp, data = mtcars)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.7121 -2.1122 -0.8854  1.5819  8.2360
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 30.09886    1.63392  18.421  < 2e-16 ***
## hp          -0.06823    0.01012  -6.742 1.79e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.863 on 30 degrees of freedom
## Multiple R-squared:  0.6024, Adjusted R-squared:  0.5892
## F-statistic: 45.46 on 1 and 30 DF,  p-value: 1.788e-07
```