

STAT_37810_Week3_Pair

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4.

```
df <- read.csv("info.csv")
df
```

##	name	age	city	favorite.color	height.cm.	weight.kg.
## 1	Peter	22	Kaohsiung	purple	183	75
## 2	Mike	51	Tainan	white	173	64
## 3	Anthony	18	Kaohsiung	red	178	68
## 4	Megan	48	Taipei	silver	160	52
## 5	Harvey	24	Nanjing	blue	187	83
## 6	Hill	52	Suining	red	168	60
## 7	Ruby	57	Chongming	white	170	75
## 8	Jack	24	Nanjing	blue	172	70

5.

```
library(tibble)
df<-df%>%add_row(name="Donald",age=74,city="NYC",favorite.color="red",height.cm.=190,weight.kg.=90)
df
```

##	name	age	city	favorite.color	height.cm.	weight.kg.
## 1	Peter	22	Kaohsiung	purple	183	75
## 2	Mike	51	Tainan	white	173	64
## 3	Anthony	18	Kaohsiung	red	178	68
## 4	Megan	48	Taipei	silver	160	52
## 5	Harvey	24	Nanjing	blue	187	83
## 6	Hill	52	Suining	red	168	60
## 7	Ruby	57	Chongming	white	170	75
## 8	Jack	24	Nanjing	blue	172	70
## 9	Donald	74	NYC	red	190	90

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

7. It seems the engine has 4 cylinders.

```
rnum<-which(rownames(mtcars)=="Datsun 710") #Row number of the Datsun 710
cnum<-which(colnames(mtcars)=="cyl") #Col number of the number of cylinders
mtcars[rnum,cnum] #It seems the engine has 4 cylinders
```

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

8. Repeating (7) using column names

```
mtcars["Datsun 710", "cyl"]
```

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

9. It seems the dataframe has 32 rows and 11 columns.

```
nrow(mtcars)
```

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

```
ncol(mtcars)
```

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

10.

```
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
```

```
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
```

11.

```
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
```

12.

```
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
```

```
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
```

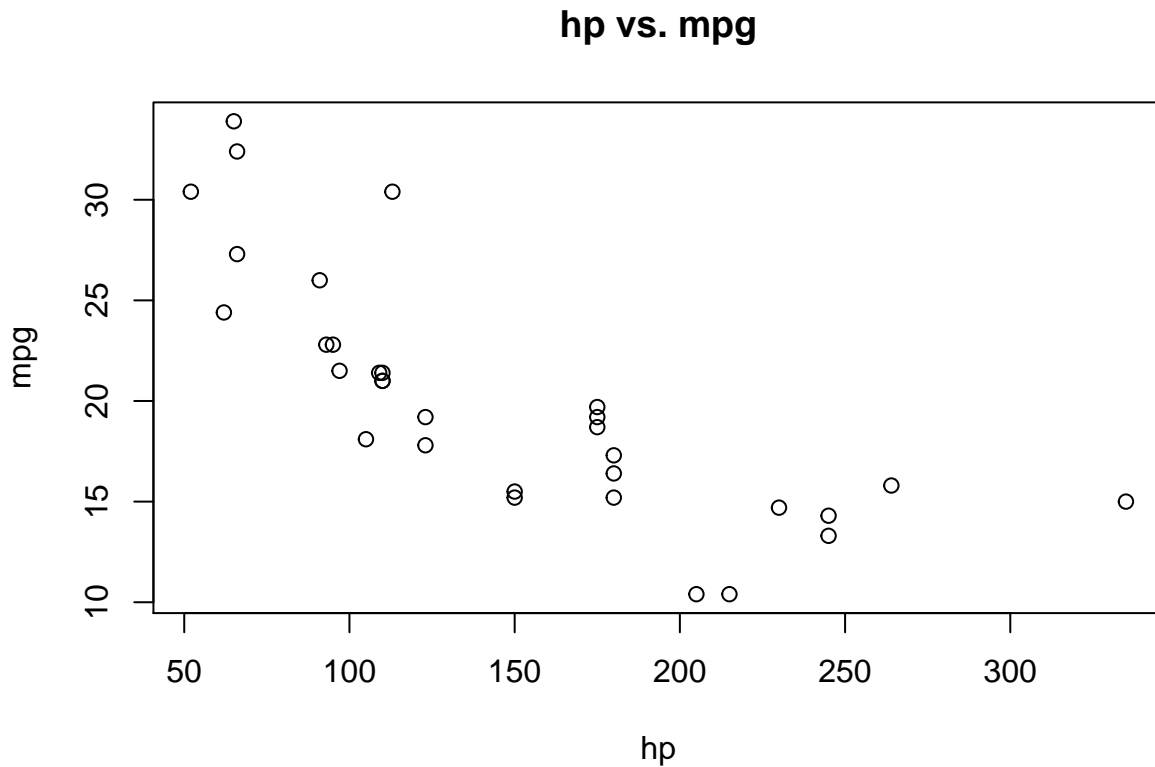
13. The mean mpg is 20.09.

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

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

14.

```
plot(mtcars$hp,mtcars$mpg,main="hp vs. mpg",xlab="hp",ylab="mpg")
```



15. It seems mpg is significantly negatively associated with hp.

```
summary(lm(mpg~hp,data=mtcars))
```

```
##
## 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
```