ARYAMAN MISHRA

19BCE1027

LAB 6

Program 1

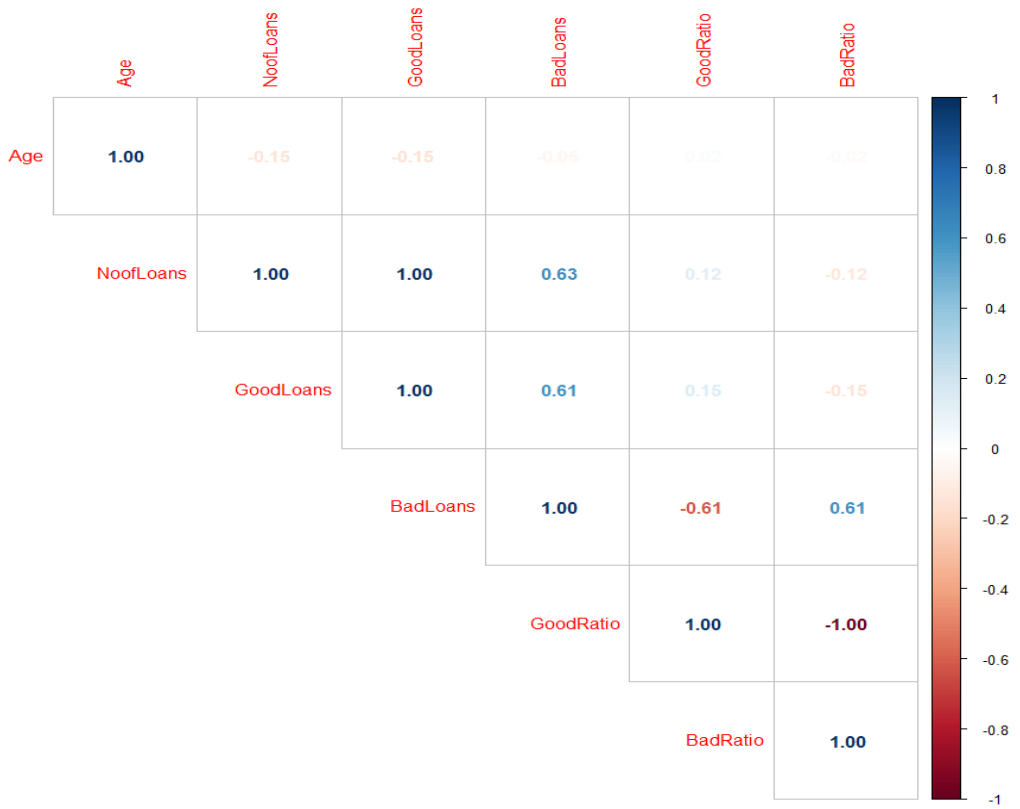
```
library(corrplot)

df=read.csv('C:\\Users\\aryam\\Desktop\\Fall Sem 2021\\Data Visualization Lab\\LAB 6 7-9-21/Loan1.csv')

print(df)

print(ncol(df))

print(nrow(df))

cor(df$NoofLoans,df$GoodLoans,method="pearson")

cor(df$NoofLoans,df$GoodLoans,method="spearman")

cor(df$NoofLoans,df$GoodLoans,method="kendall")

cor.test(df$NoofLoans,df$GoodLoans,method="pearson")

M=cor(df)

print(M)


corrplot(M,method='number',type='upper')

corrplot(M,method='number',type='lower')

corrplot(M,method='number')

corrplot(M,method='circle')

corrplot(M,method='pie')

corrplot(M,method='shade')

corrplot(M,method='color')

corrplot(M,method='ellipse')

corrplot(M,method='square')
```

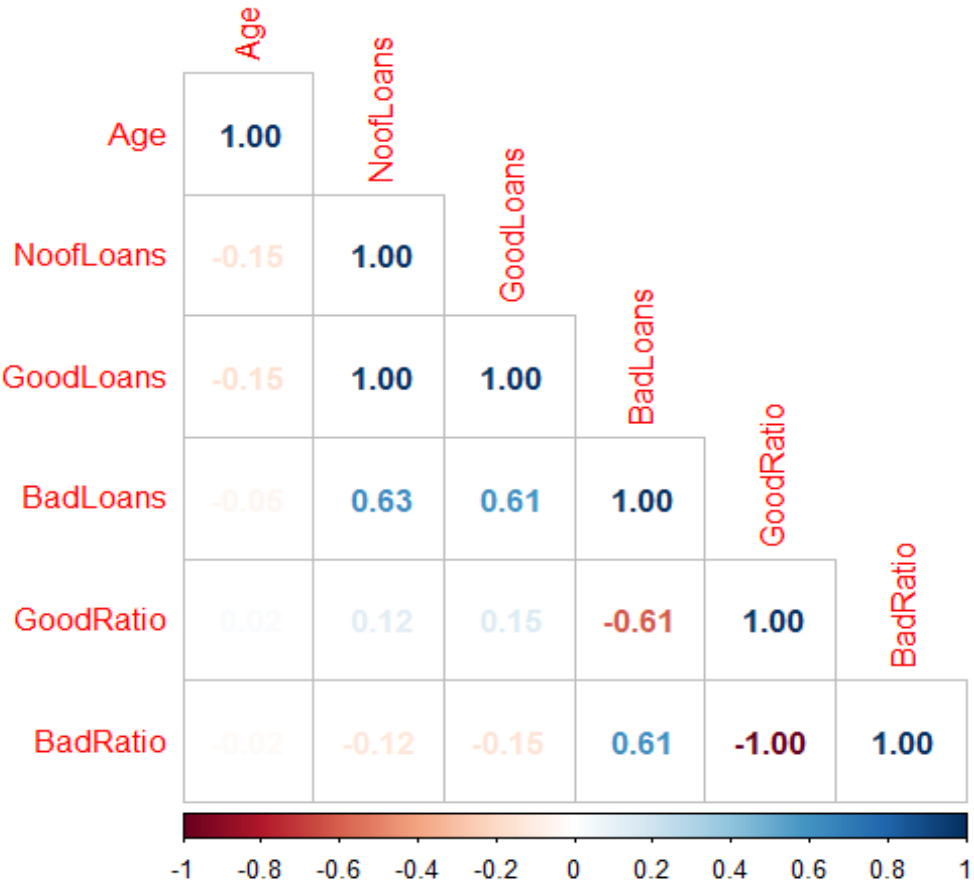
CONSOLE:

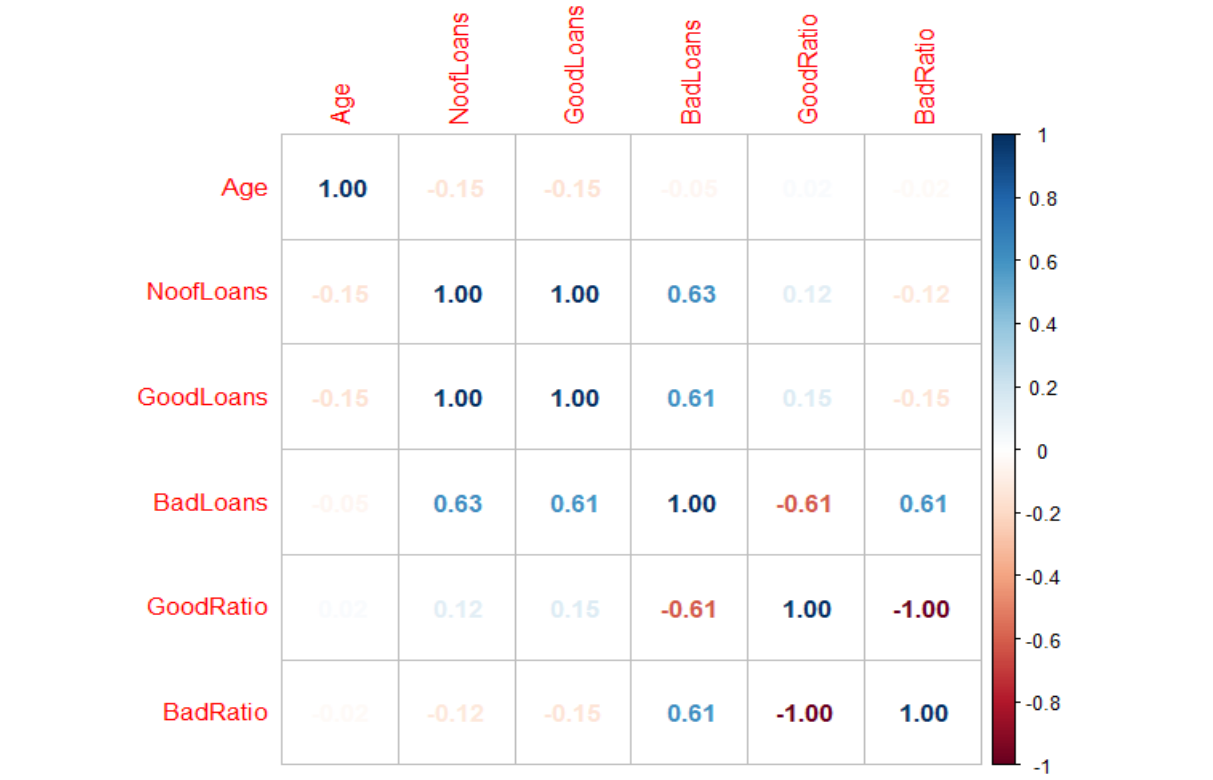
```
> library(corrplot)

> df=read.csv('C:\\Users\\aryam\\Desktop\\Fall Sem 2021\\Data Visualization Lab\\LAB 6 7-9-21/Loan1.csv')
```

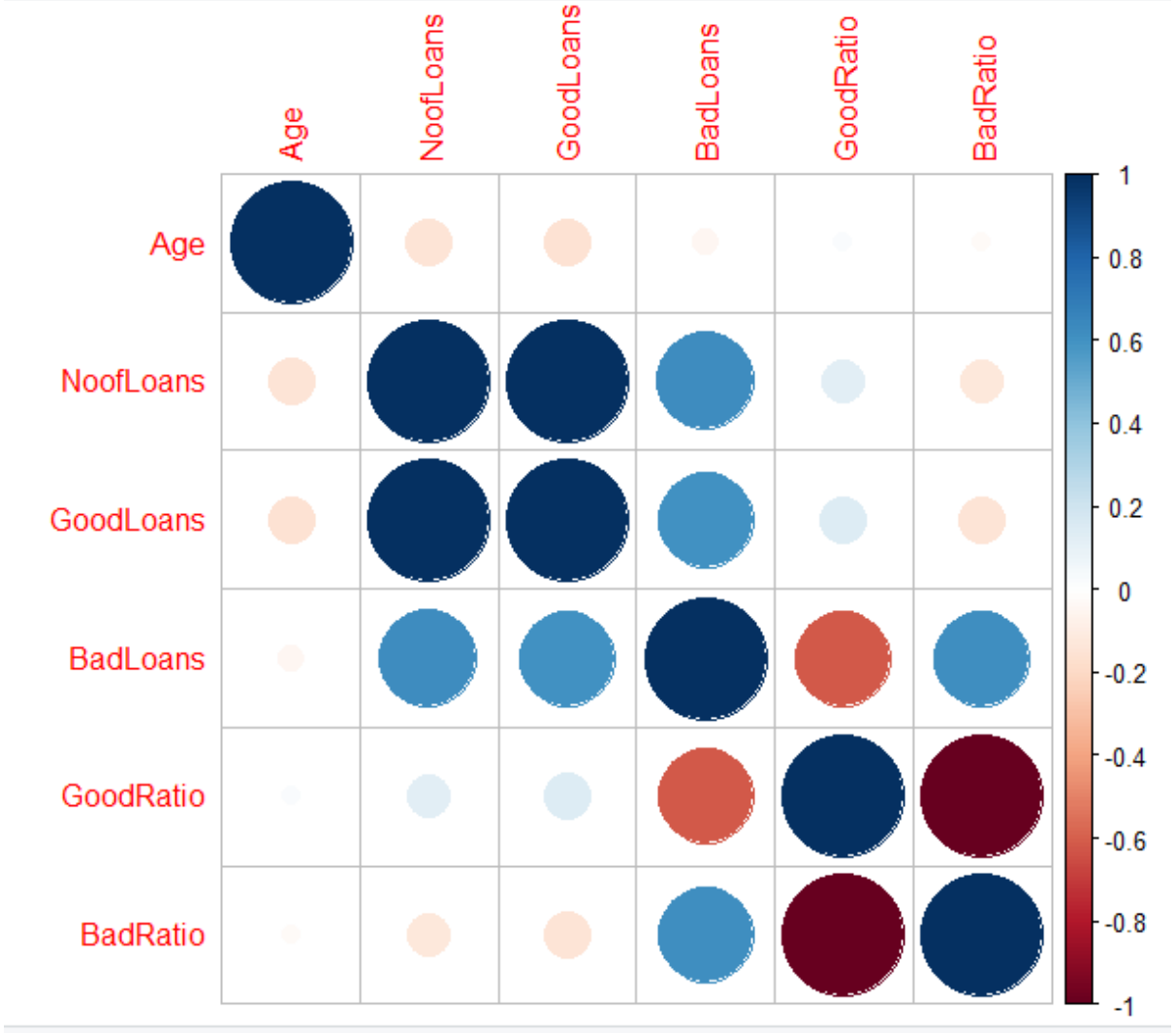
```
> print(df)
   Age NoofLoans GoodLoans BadLoans GoodRatio BadRatio
1   22      400      390      10     97.5     2.5
2   23      503      480      23     95.4     4.6
3   24    15000    14800     200     98.7     1.3
4   25     2500     2457      43     98.3     1.7
5   26     8000     7763     237     97.0     3.0
6   27     9000     8544     456     94.9     5.1
7   28     7000     6740     260     96.3     3.7
8   29     6000     5700     300     95.0     5.0
9   30     5050     4752     298     94.1     5.9
10  31     6408     6372      36     99.4     0.6
11  32     4568     4493      75     98.4     1.6
12  33     2346     2283      63     97.3     2.7
13  34      500      484      16     96.8     3.2
> print(ncol(df))
[1] 6
> print(nrow(df))
[1] 13
> cor(df$NoofLoans,df$GoodLoans,method="pearson")
[1] 0.9996171
> cor(df$NoofLoans,df$GoodLoans,method="spearman")
[1] 0.9945055
> cor(df$NoofLoans,df$GoodLoans,method="kendall")
[1] 0.974359
> cor.test(df$NoofLoans,df$GoodLoans,method="pearson")

        Pearson's product-moment correlation

data:  df$NoofLoans and df$GoodLoans
t = 119.81, df = 11, p-value < 2.2e-16
```

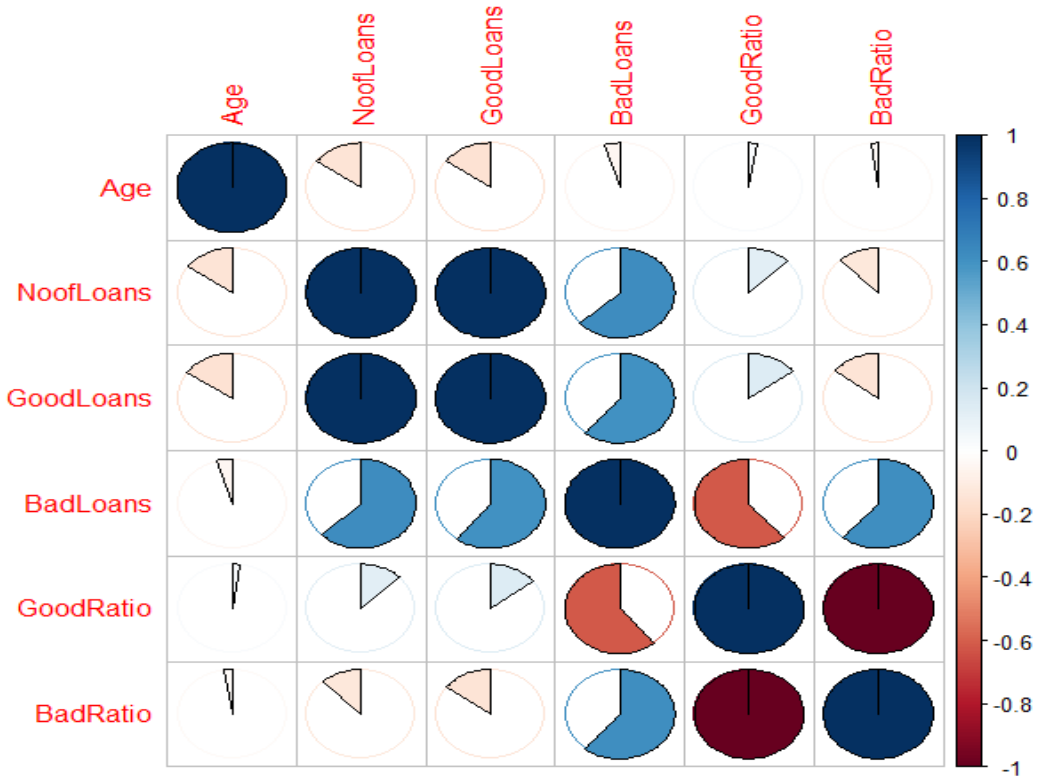
```
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.9986779 0.9998891
sample estimates:
      cor
0.9996171


> M=cor(df)
> print(M)
               Age  NoofLoans  GoodLoans    BadLoans   GoodRatio    BadRatio
Age         1.00000000 -0.1499763 -0.1516040 -0.04717977  0.02218187 -0.02218187
NoofLoans -0.14997631  1.0000000  0.9996171  0.62993860  0.12134661 -0.12134661
GoodLoans -0.15160400  0.9996171  1.0000000  0.60820668  0.14577036 -0.14577036
BadLoans  -0.04717977  0.6299386  0.6082067  1.00000000 -0.61036205  0.61036205
GoodRatio  0.02218187  0.1213466  0.1457704 -0.61036205  1.00000000 -1.00000000
BadRatio  -0.02218187 -0.1213466 -0.1457704  0.61036205 -1.00000000  1.00000000
>
> corrplot(M,method='number',type='upper')
> corrplot(M,method='number',type='lower')
> corrplot(M,method='number')
> corrplot(M,method='circle')
> corrplot(M,method='pie')
> corrplot(M,method='shade')
> corrplot(M,method='color')
> corrplot(M,method='ellipse')
> corrplot(M,method='square')
```

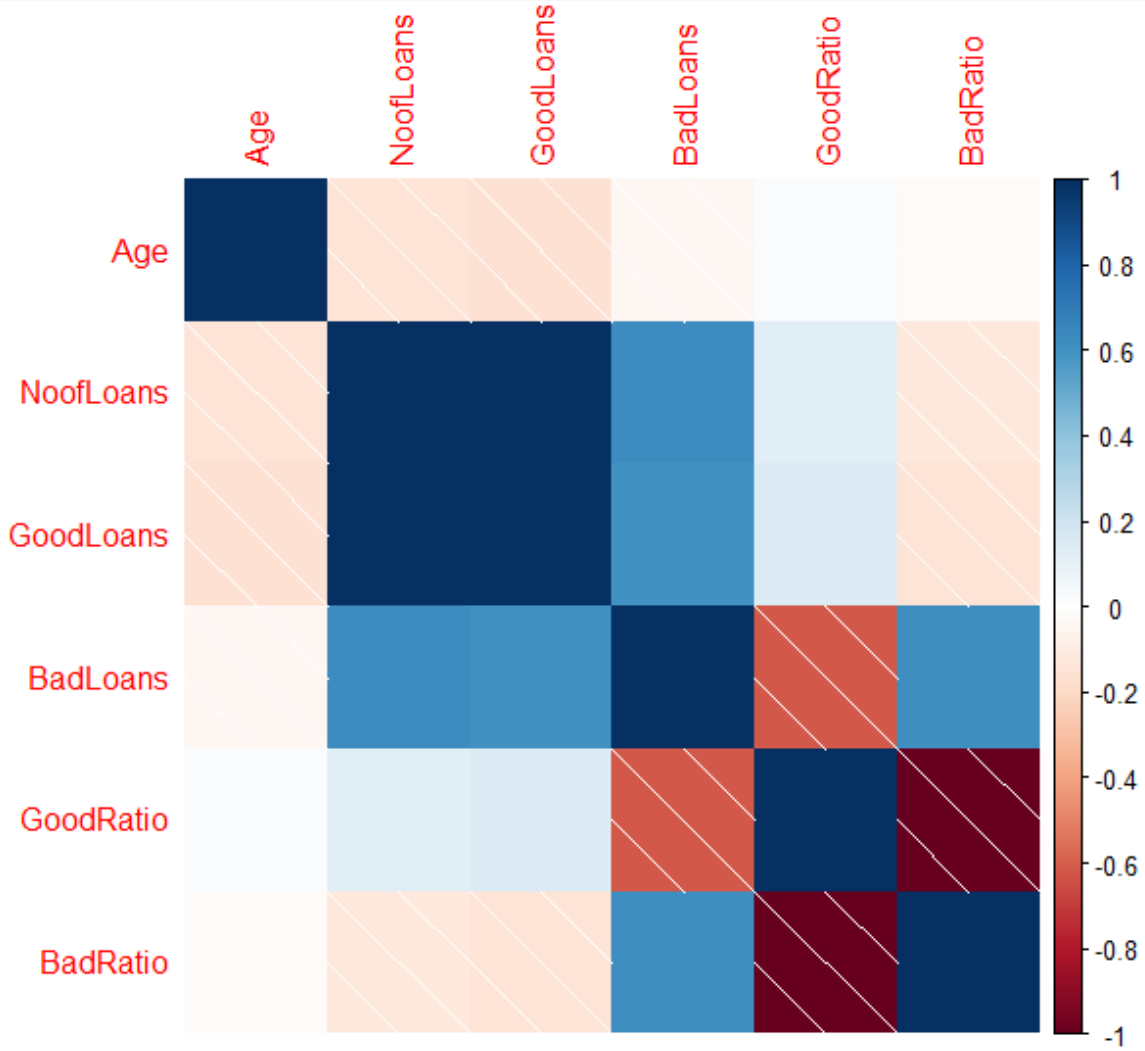

Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1.00
-0.15
-0.15
-0.05
0.02
-0.02
1.00
1.00
0.63
0.12
-0.12
1.00
0.61
0.15
-0.15
1.00
-0.61
0.61
1.00
-1.00
1.00
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

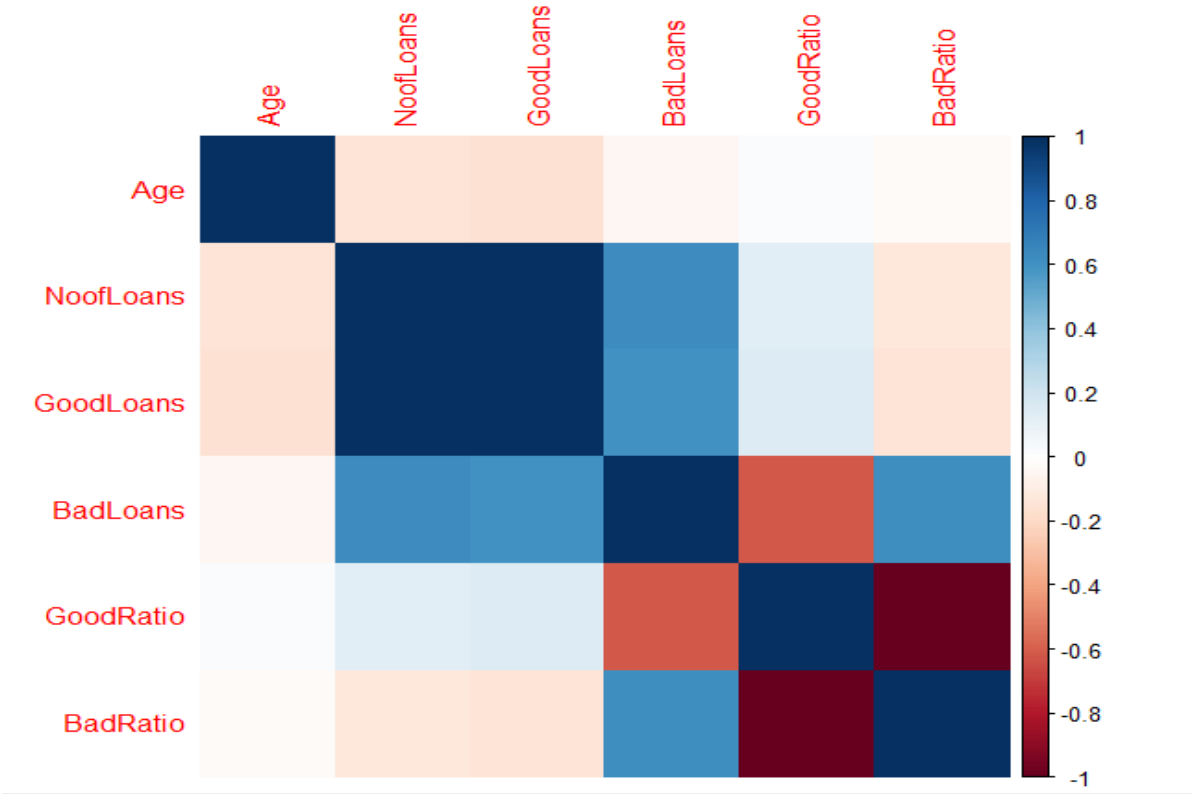

Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1.00
-0.15 1.00
-0.15 1.00 1.00
-0.05 0.63 0.61 1.00
0.02 0.12 0.15 -0.61 1.00
-0.02 -0.12 -0.15 0.61 -1.00 1.00
-1 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1

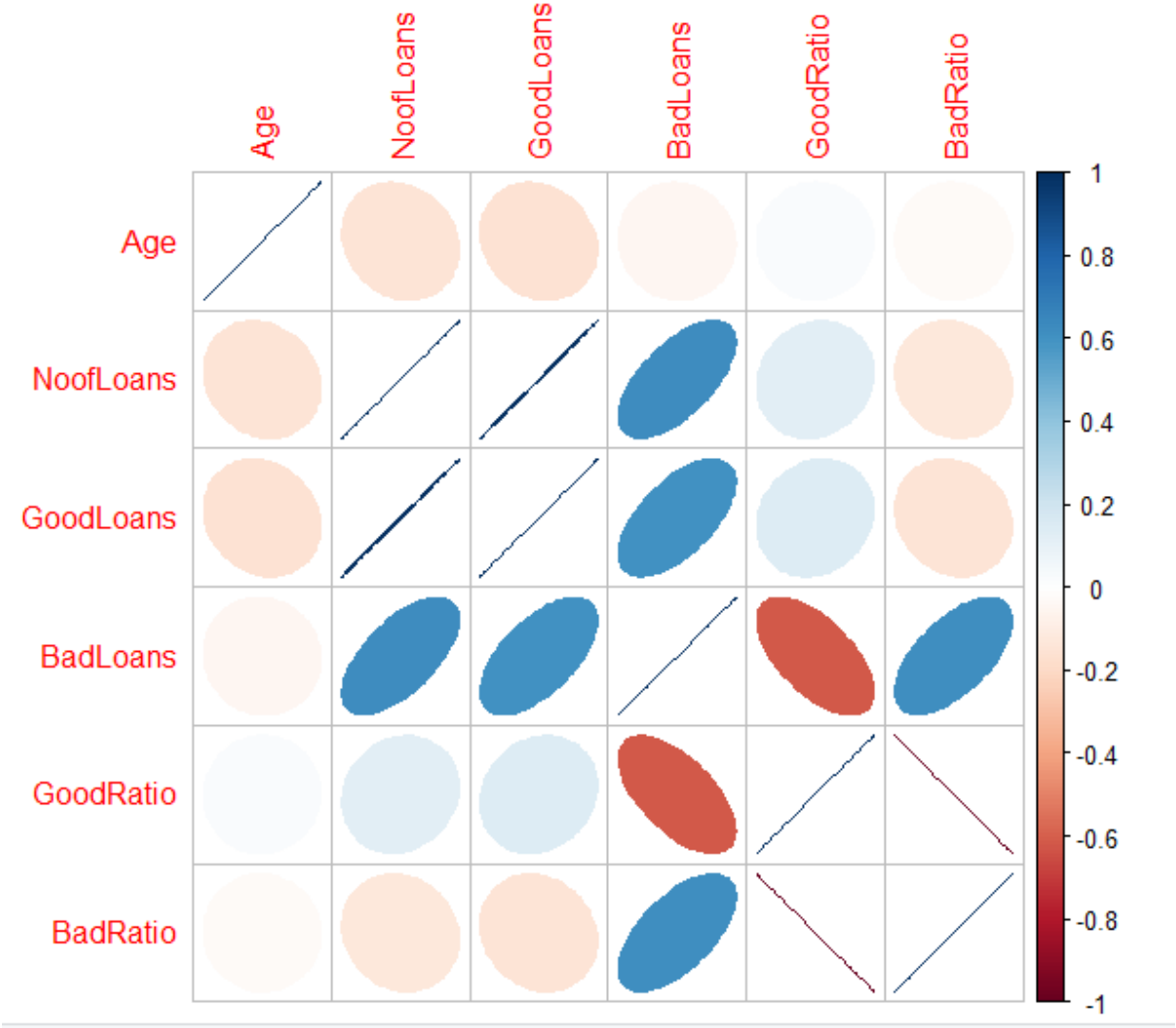

Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1.00 -0.15 -0.15 -0.05 0.02 -0.02
-0.15 1.00 1.00 0.63 0.12 -0.12
-0.15 1.00 1.00 0.61 0.15 -0.15
-0.05 0.63 0.61 1.00 -0.61 0.61
0.02 0.12 0.15 -0.61 1.00 -1.00
-0.02 -0.12 -0.15 0.61 -1.00 1.00
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

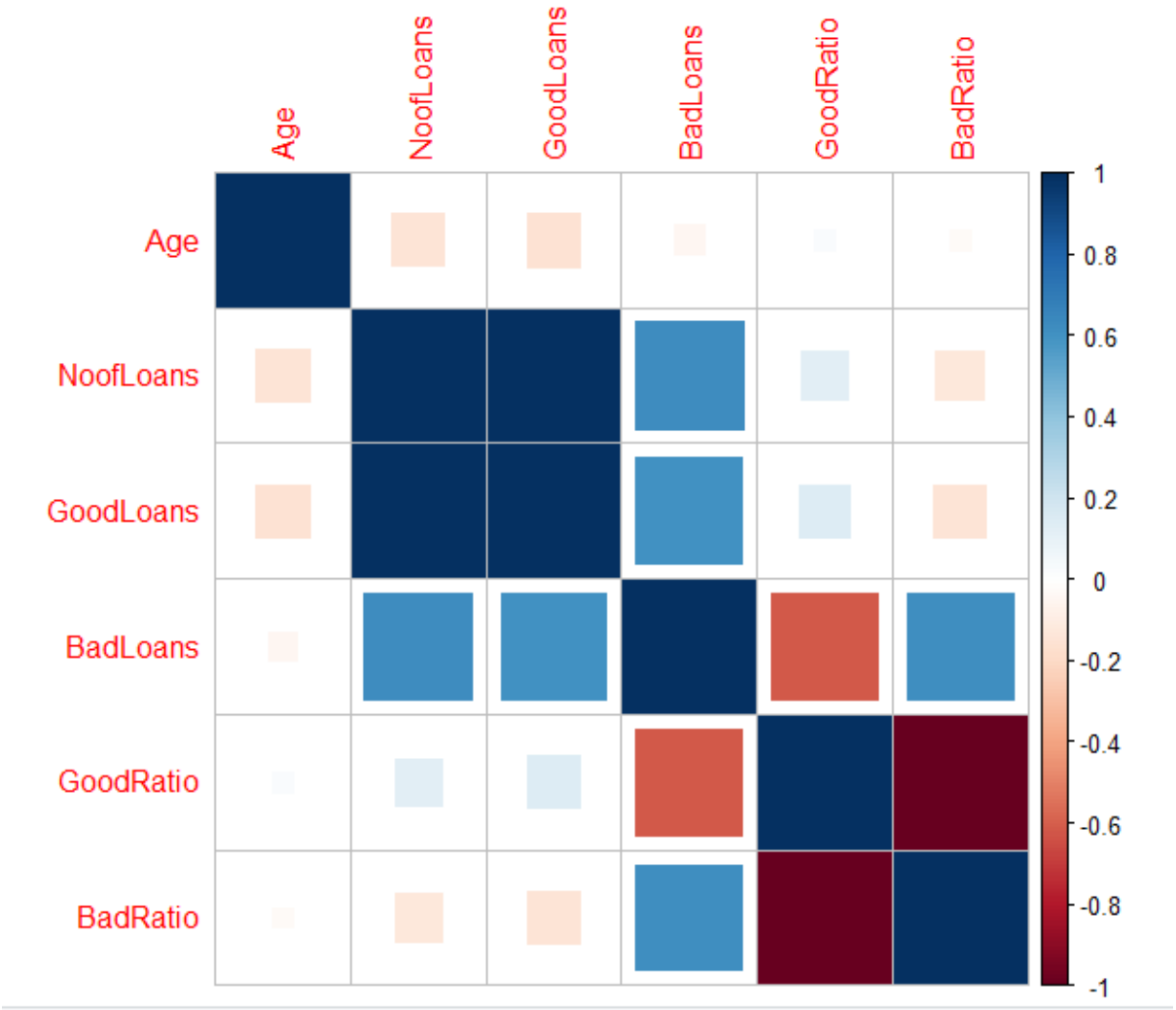

Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Age
NoofLoans
GoodLoans
BadLoans
GoodRatio
BadRatio
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

Program 2

```
library(corrplot)

df=read.csv('C:\\Users\\aryam\\Desktop\\Fall Sem 2021\\Data Visualization Lab\\LAB 6 7-9-21/mtcars.csv')

print(df)

print(ncol(df))

print(nrow(df))

cor(df$mpg,df$wt,method="pearson")

cor(df$mpg,df$wt,method="spearman")

cor(df$mpg,df$wt,method="kendall")

cor.test(df$mpg,df$wt,method="pearson")

sapply(mtcars, class)

M=cor(mtcars[sapply(mtcars, function(x) !is.factor(x))])

print(M)

corrplot(M,method='number',type='upper')

corrplot(M,method='number',type='lower')

corrplot(M,method='number')

corrplot(M,method='circle')

corrplot(M,method='pie')

corrplot(M,method='shade')

corrplot(M,method='color')

corrplot(M,method='ellipse')

corrplot(M,method='square')
```

CONSOLE:

```
> library(corrplot)

> df=read.csv('C:\\Users\\aryam\\Desktop\\Fall Sem 2021\\Data Visualization Lab\\LAB 6 7-9-21/mtcars.csv')

> print(df)

              model  mpg cyl  disp  hp drat    wt  qsec vs am gear carb

1         Mazda RX4 21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4

2     Mazda RX4 Wag 21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
```

```
3          Datsun 710 22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
4      Hornet 4 Drive 21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
5   Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
6             Valiant 18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
7          Duster 360 14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
8           Merc 240D 24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
9           Merc 230 22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
10          Merc 280 19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
11          Merc 280C 17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
12         Merc 450SE 16.4   8 275.8 180 3.07 4.070 17.40  0  0    3    3
13         Merc 450SL 17.3   8 275.8 180 3.07 3.730 17.60  0  0    3    3
14        Merc 450SLC 15.2   8 275.8 180 3.07 3.780 18.00  0  0    3    3
15  Cadillac Fleetwood 10.4   8 472.0 205 2.93 5.250 17.98  0  0    3    4
16 Lincoln Continental 10.4   8 460.0 215 3.00 5.424 17.82  0  0    3    4
17   Chrysler Imperial 14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
18           Fiat 128 32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
19        Honda Civic 30.4   4  75.7  52 4.93 1.615 18.52  1  1    4    2
20     Toyota Corolla 33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
21      Toyota Corona 21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
22    Dodge Challenger 15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
23         AMC Javelin 15.2   8 304.0 150 3.15 3.435 17.30  0  0    3    2
24          Camaro Z28 13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
25    Pontiac Firebird 19.2   8 400.0 175 3.08 3.845 17.05  0  0    3    2
26          Fiat X1-9 27.3   4  79.0  66 4.08 1.935 18.90  1  1    4    1
27       Porsche 914-2 26.0   4 120.3  91 4.43 2.140 16.70  0  1    5    2
28        Lotus Europa 30.4   4  95.1 113 3.77 1.513 16.90  1  1    5    2
29      Ford Pantera L 15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
30        Ferrari Dino 19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
31       Maserati Bora 15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
32          Volvo 142E 21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
> print(ncol(df))
[1] 12
> print(nrow(df))
```

```
[1] 32

> cor(df$mpg,df$wt,method="pearson")

[1] -0.8676594

> cor(df$mpg,df$wt,method="spearman")

[1] -0.886422

> cor(df$mpg,df$wt,method="kendall")

[1] -0.7278321

> cor.test(df$mpg,df$wt,method="pearson")


        Pearson's product-moment correlation


data:  df$mpg and df$wt

t = -9.559, df = 30, p-value = 1.294e-10

alternative hypothesis: true correlation is not equal to 0

95 percent confidence interval:

 -0.9338264 -0.7440872

sample estimates:

      cor

-0.8676594


> sapply(mtcars, class)

    mpg      cyl     disp       hp     drat       wt     qsec       vs       am     gear     carb

"numeric" "numeric" "numeric" "numeric" "numeric" "numeric" "numeric" "numeric" "numeric" "numeric"
"numeric"

> M=cor(mtcars[sapply(mtcars, function(x) !is.factor(x))])

> print(M)

         mpg       cyl      disp        hp       drat        wt      qsec        vs        am      gear       carb

mpg   1.0000000 -0.8521620 -0.8475514 -0.7761684  0.68117191 -0.8676594  0.41868403  0.6640389
0.59983243  0.4802848 -0.55092507

cyl  -0.8521620  1.0000000  0.9020329  0.8324475 -0.69993811  0.7824958 -0.59124207 -0.8108118 -
0.52260705 -0.4926866  0.52698829

disp -0.8475514  0.9020329  1.0000000  0.7909486 -0.71021393  0.8879799 -0.43369788 -0.7104159 -
0.59122704 -0.5555692  0.39497686

hp   -0.7761684  0.8324475  0.7909486  1.0000000 -0.44875912  0.6587479 -0.70822339 -0.7230967 -
0.24320426 -0.1257043  0.74981247
```

drat 0.6811719 -0.6999381 -0.7102139 -0.4487591 1.00000000 -0.7124406 0.09120476 0.4402785 0.71271113 0.6996101 -0.09078980

wt -0.8676594 0.7824958 0.8879799 0.6587479 -0.71244065 1.0000000 -0.17471588 -0.5549157 -0.69249526 -0.5832870 0.42760594

qsec 0.4186840 -0.5912421 -0.4336979 -0.7082234 0.09120476 -0.1747159 1.00000000 0.7445354 -0.22986086 -0.2126822 -0.65624923

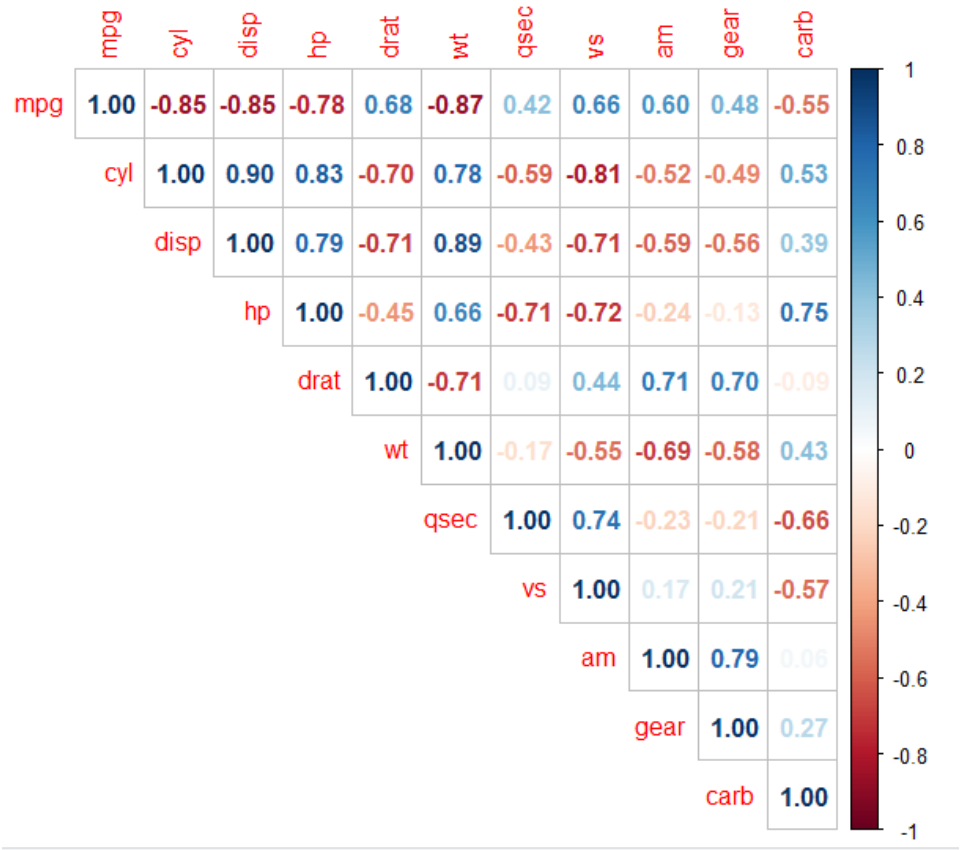
vs 0.6640389 -0.8108118 -0.7104159 -0.7230967 0.44027846 -0.5549157 0.74453544 1.0000000 0.16834512 0.2060233 -0.56960714

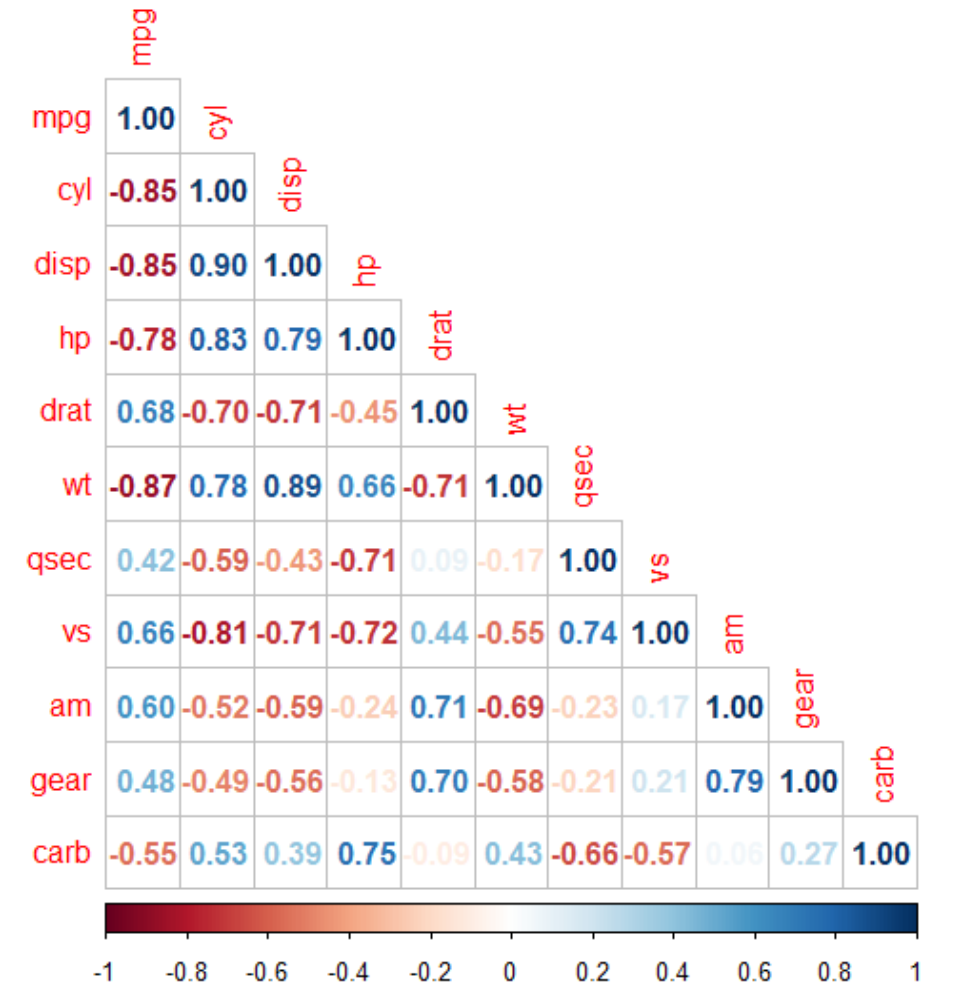
am 0.5998324 -0.5226070 -0.5912270 -0.2432043 0.71271113 -0.6924953 -0.22986086 0.1683451 1.00000000 0.7940588 0.05753435

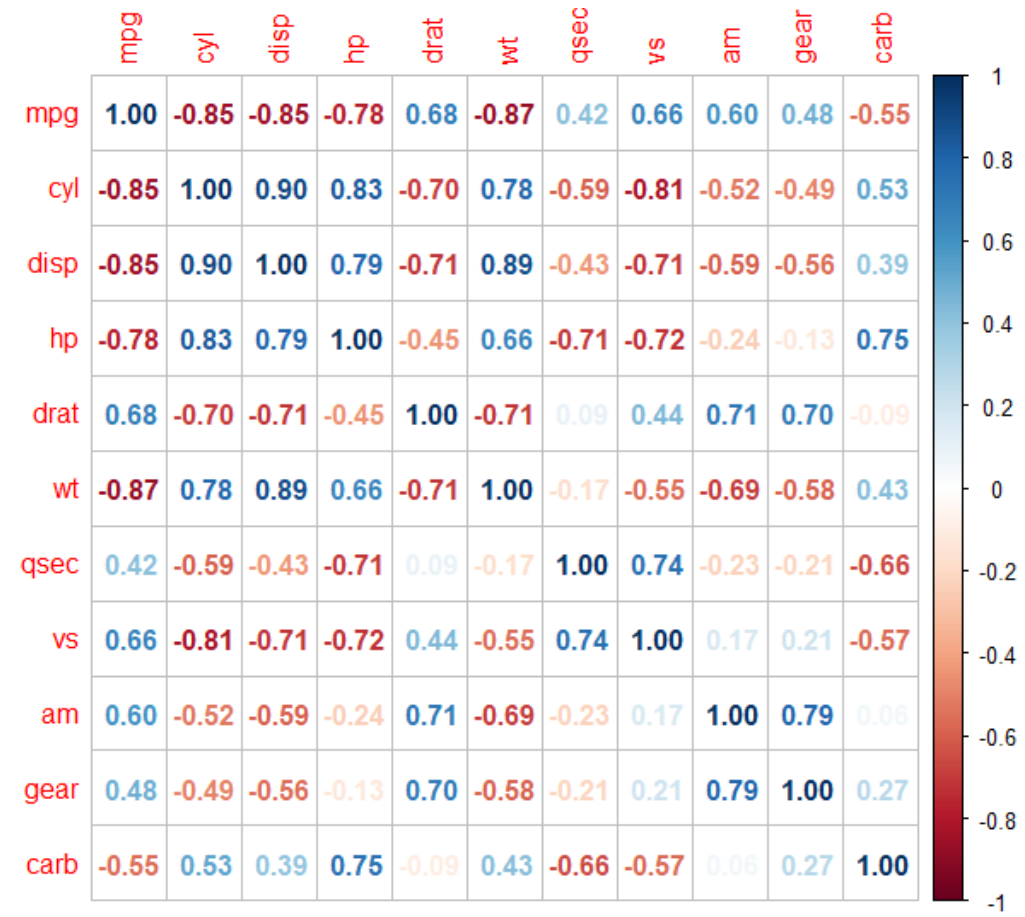
gear 0.4802848 -0.4926866 -0.5555692 -0.1257043 0.69961013 -0.5832870 -0.21268223 0.2060233 0.79405876 1.0000000 0.27407284

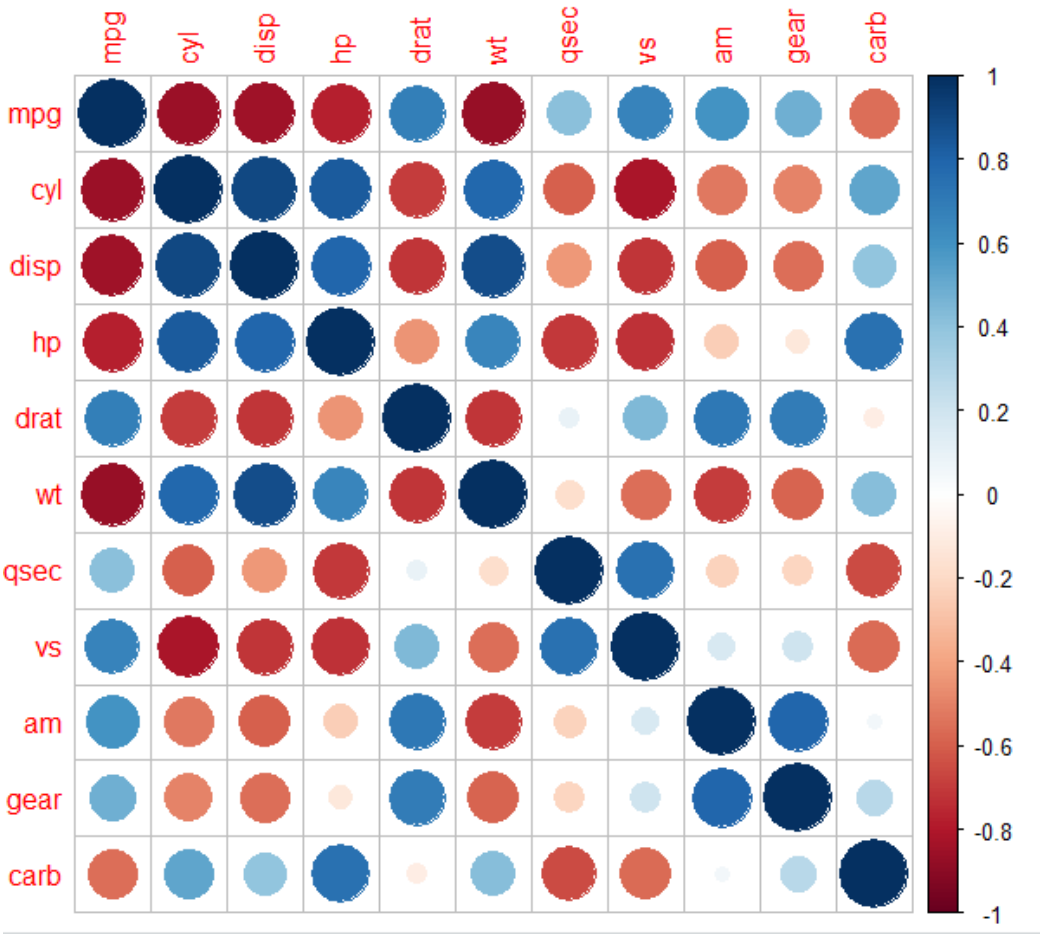
carb -0.5509251 0.5269883 0.3949769 0.7498125 -0.09078980 0.4276059 -0.65624923 -0.5696071 0.05753435 0.2740728 1.00000000

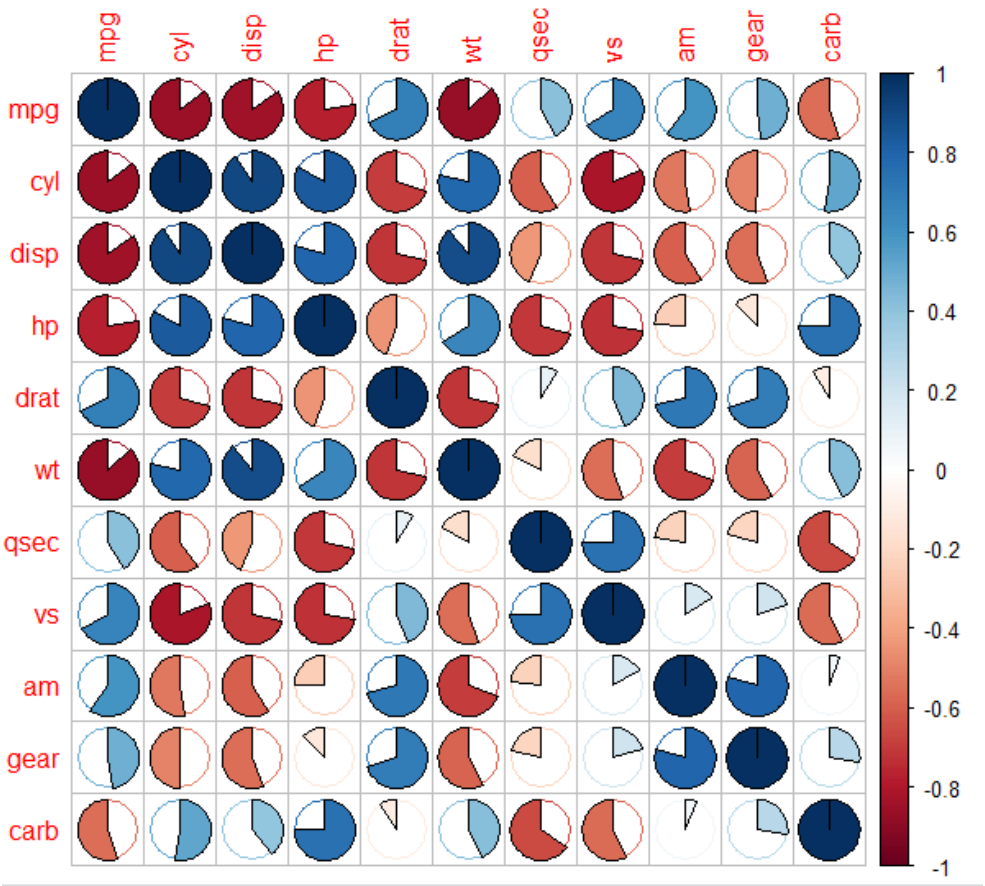
```
> corrplot(M,method='number',type='upper')

> corrplot(M,method='number',type='lower')

> corrplot(M,method='number')

> corrplot(M,method='circle')

> corrplot(M,method='pie')

> corrplot(M,method='shade')

> corrplot(M,method='color')

> corrplot(M,method='ellipse')

> corrplot(M,method='square')
```

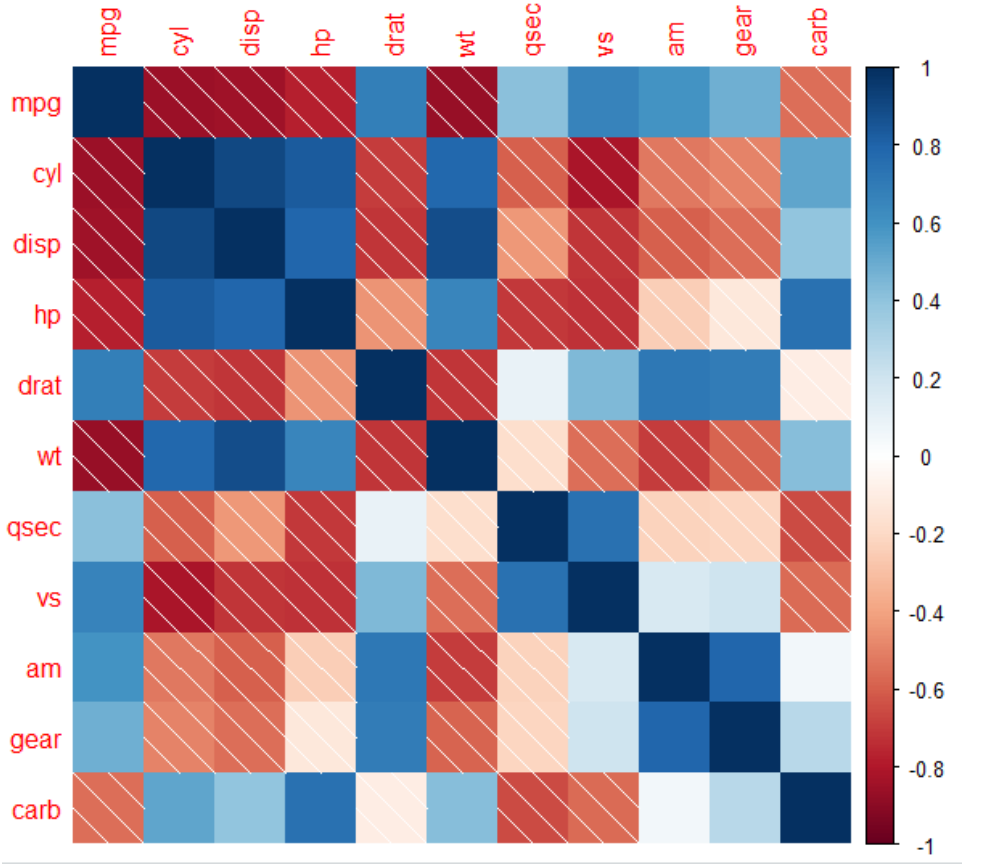

mpg cyl disp hp drat wt qsec vs am gear carb
mpg 1.00 -0.85 -0.85 -0.78 0.68 -0.87 0.42 0.66 0.60 0.48 -0.55
cyl 1.00 0.90 0.83 -0.70 0.78 -0.59 -0.81 -0.52 -0.49 0.53
disp 1.00 0.79 -0.71 0.89 -0.43 -0.71 -0.59 -0.56 0.39
hp 1.00 -0.45 0.66 -0.71 -0.72 -0.24 -0.13 0.75
drat 1.00 -0.71 0.09 0.44 0.71 0.70 -0.09
wt 1.00 -0.17 -0.55 -0.69 -0.58 0.43
qsec 1.00 0.74 -0.23 -0.21 -0.66
vs 1.00 0.17 0.21 -0.57
am 1.00 0.79 0.06
gear 1.00 0.27
carb 1.00
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

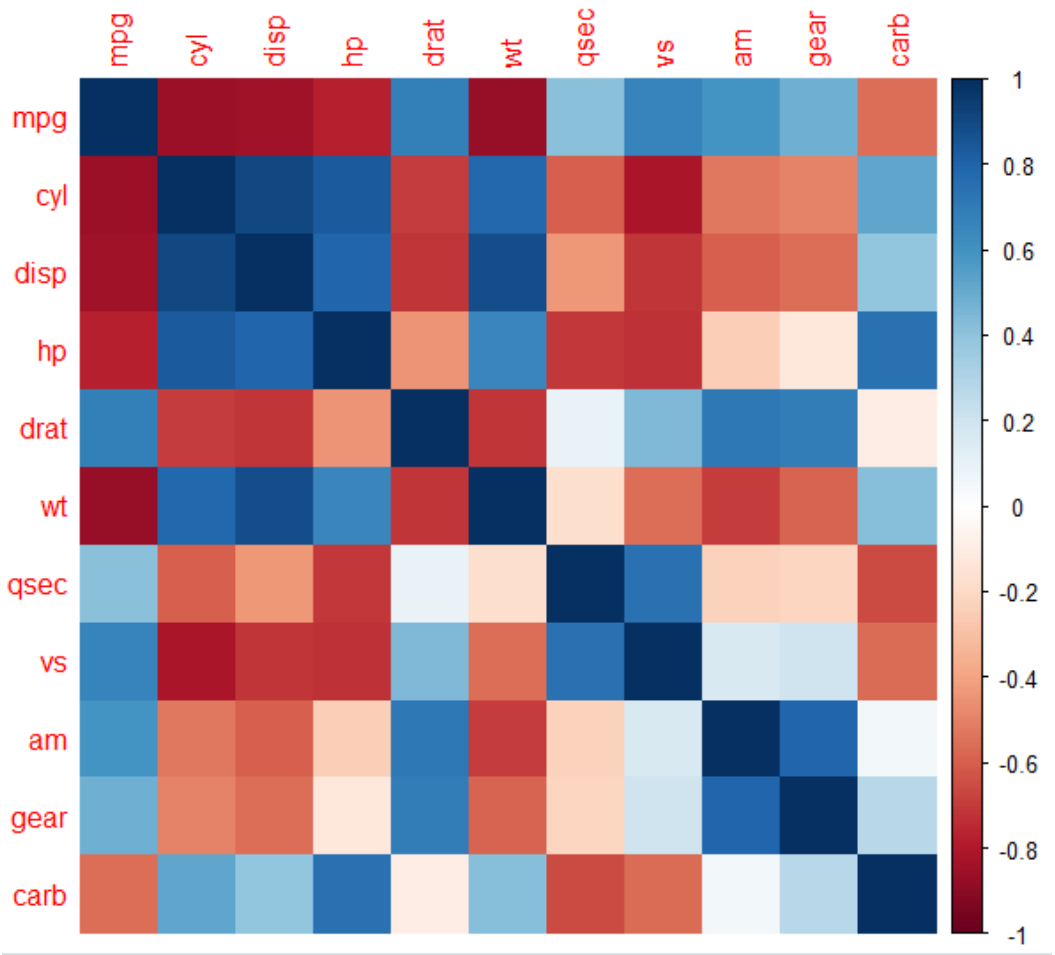

mpg
mpg 1.00
cyl -0.85 1.00
disp -0.85 0.90 1.00
hp -0.78 0.83 0.79 1.00
drat 0.68 -0.70 -0.71 -0.45 1.00
wt -0.87 0.78 0.89 0.66 -0.71 1.00
qsec 0.42 -0.59 -0.43 -0.71 0.09 -0.17 1.00
vs 0.66 -0.81 -0.71 -0.72 0.44 -0.55 0.74 1.00
am 0.60 -0.52 -0.59 -0.24 0.71 -0.69 -0.23 0.17 1.00
gear 0.48 -0.49 -0.56 -0.13 0.70 -0.58 -0.21 0.21 0.79 1.00
carb -0.55 0.53 0.39 0.75 -0.09 0.43 -0.66 -0.57 0.06 0.27 1.00
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
-1 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1

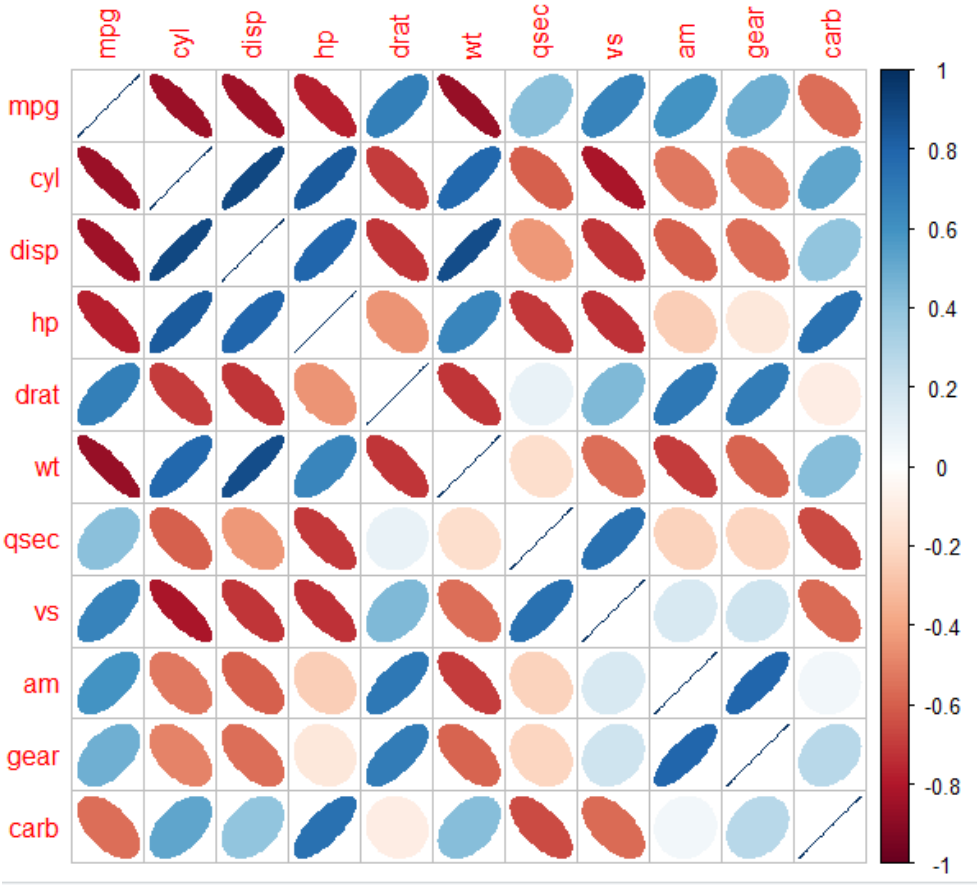

mpg cyl disp hp drat wt qsec vs am gear carb
mpg 1.00 -0.85 -0.85 -0.78 0.68 -0.87 0.42 0.66 0.60 0.48 -0.55
cyl -0.85 1.00 0.90 0.83 -0.70 0.78 -0.59 -0.81 -0.52 -0.49 0.53
disp -0.85 0.90 1.00 0.79 -0.71 0.89 -0.43 -0.71 -0.59 -0.56 0.39
hp -0.78 0.83 0.79 1.00 -0.45 0.66 -0.71 -0.72 -0.24 -0.13 0.75
drat 0.68 -0.70 -0.71 -0.45 1.00 -0.71 0.09 0.44 0.71 0.70 -0.09
wt -0.87 0.78 0.89 0.66 -0.71 1.00 -0.17 -0.55 -0.69 -0.58 0.43
qsec 0.42 -0.59 -0.43 -0.71 0.09 -0.17 1.00 0.74 -0.23 -0.21 -0.66
vs 0.66 -0.81 -0.71 -0.72 0.44 -0.55 0.74 1.00 0.17 0.21 -0.57
am 0.60 -0.52 -0.59 -0.24 0.71 -0.69 -0.23 0.17 1.00 0.79 0.06
gear 0.48 -0.49 -0.56 -0.13 0.70 -0.58 -0.21 0.21 0.79 1.00 0.27
carb -0.55 0.53 0.39 0.75 -0.09 0.43 -0.66 -0.57 0.06 0.27 1.00
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1

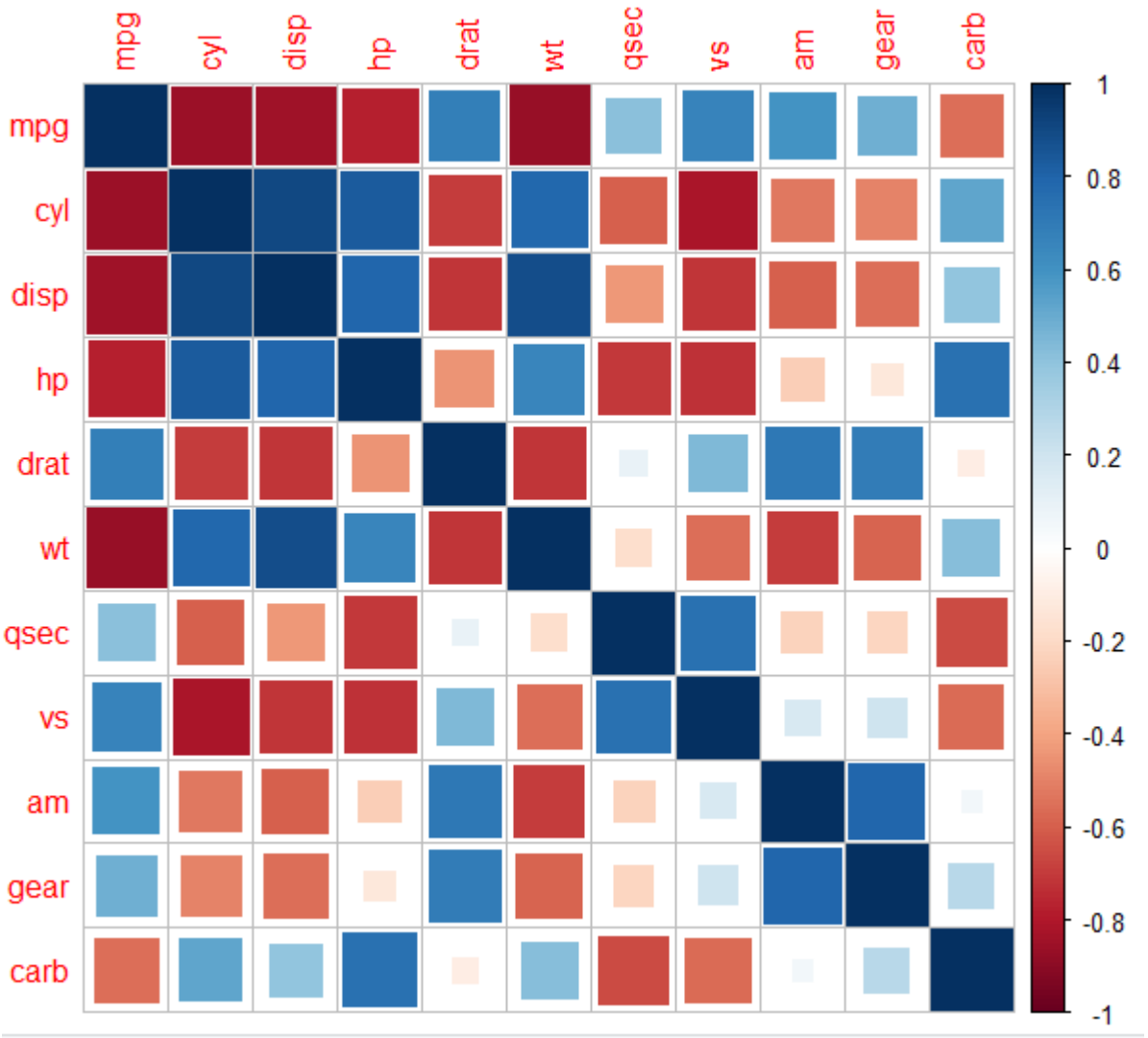

mpg cyl disp hp drat wt qsec vs am gear carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


mpg
cyl
disp
hp
drat
wt
qsec
vs
am
gear
carb
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1