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DAAN 682
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Homework_3: Output from the Terminal

%runfile %runfile C:/Users/dylan/OneDrive/Documents/GRAD_SCHOOL/DAAN_682/HOMEWORK_3/Homework_3.py --wdir
A high level overview of the data is listed below:

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 32 entries, 0 to 31
Data columns (total 12 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   model   32 non-null     object
 1   mpg     32 non-null     float64
 2   cyl     32 non-null     int64
 3   disp    32 non-null     float64
 4   hp      32 non-null     int64
 5   drat    32 non-null     float64
 6   wt      32 non-null     float64
 7   qsec    32 non-null     float64
 8   vs      32 non-null     int64
 9   am      32 non-null     int64
 10  gear    32 non-null     int64
 11  carb    32 non-null     int64
dtypes: float64(5), int64(6), object(1)
memory usage: 3.1+ KB
```

A summary of statistics of mtcars are listed below. These summary stats include: mean, std., min, max, and quartiles.

```
              mpg       cyl        disp  ...        am      gear      carb
count  32.000000  32.000000   32.000000  ...  32.000000  32.000000  32.0000
mean   20.090625   6.187500  230.721875  ...   0.406250   3.687500   2.8125
std     6.026948   1.785922  123.938694  ...   0.498991   0.737804   1.6152
min    10.400000   4.000000   71.100000  ...   0.000000   3.000000   1.0000
25%    15.425000   4.000000  120.825000  ...   0.000000   3.000000   2.0000
50%    19.200000   6.000000  196.300000  ...   0.000000   4.000000   2.0000
75%    22.800000   8.000000  326.000000  ...   1.000000   4.000000   4.0000
max    33.900000   8.000000  472.000000  ...   1.000000   5.000000   8.0000

[8 rows x 11 columns]
```

Here are the max values for each of the indexes, along with the corresponding model

```
   Column              Model   Max_value
0   model         Volvo 142E  Volvo 142E
1     mpg       Toyota Corolla        33.9
2     cyl    Hornet Sportabout           8
```

```
3    disp   Cadillac Fleetwood      472.0
4      hp       Maserati Bora        335
5    drat         Honda Civic       4.93
6      wt  Lincoln Continental      5.424
7    qsec           Merc 230       22.9
8      vs         Datsun 710          1
9      am          Mazda RX4          1
10   gear       Porsche 914-2          5
11   carb       Maserati Bora          8
The correlation matrix is given by:          mpg      cyl     disp  ...       am     gear     carb
mpg   1.000000 -0.852162 -0.847551  ...  0.599832  0.480285 -0.550925
cyl  -0.852162  1.000000  0.902033  ... -0.522607 -0.492687  0.526988
disp -0.847551  0.902033  1.000000  ... -0.591227 -0.555569  0.394977
hp   -0.776168  0.832447  0.790949  ... -0.243204 -0.125704  0.749812
drat  0.681172 -0.699938 -0.710214  ...  0.712711  0.699610 -0.090790
wt   -0.867659  0.782496  0.887980  ... -0.692495 -0.583287  0.427606
qsec  0.418684 -0.591242 -0.433698  ... -0.229861 -0.212682 -0.656249
vs    0.664039 -0.810812 -0.710416  ...  0.168345  0.206023 -0.569607
am    0.599832 -0.522607 -0.591227  ...  1.000000  0.794059  0.057534
gear  0.480285 -0.492687 -0.555569  ...  0.794059  1.000000  0.274073
carb -0.550925  0.526988  0.394977  ...  0.057534  0.274073  1.000000

[11 rows x 11 columns]
mpg has the highest positive correlation with drat, with a correlation of 0.6811719078067492
cyl has the highest positive correlation with disp, with a correlation of 0.9020328721469987
disp has the highest positive correlation with cyl, with a correlation of 0.9020328721469987
hp has the highest positive correlation with cyl, with a correlation of 0.8324474527218193
drat has the highest positive correlation with am, with a correlation of 0.7127111272262698
wt has the highest positive correlation with disp, with a correlation of 0.8879799220581379
qsec has the highest positive correlation with vs, with a correlation of 0.7445354435262542
vs has the highest positive correlation with qsec, with a correlation of 0.7445354435262542
am has the highest positive correlation with gear, with a correlation of 0.7940587602563435
gear has the highest positive correlation with am, with a correlation of 0.7940587602563435
carb has the highest positive correlation with hp, with a correlation of 0.7498124715491102
         mean  median   min   max
gear
3    16.106667    15.5  10.4  21.5
4    24.533333    22.8  17.8  33.9
5    21.380000    19.7  15.0  30.4
The gear with that produces the best MPG is gear: 4
         mean  median   min
carb
1    25.342857   22.80  18.1
2    22.400000   22.10  15.2
```

3 16.300000 16.40 15.2
4 15.790000 15.25 10.4
6 19.700000 19.70 19.7
8 15.000000 15.00 15.0
The carb with that produces the best MPG is carb: 1
The attribute that contributes the most to mpg is wt with a correlation value of:
0.8676593765172276