```python
# Task 1
from google.colab import files
from IPython.display import Image

uploaded = files.upload()
Image(filename="HeadshotName.jpg")
```

```
<IPython.core.display.HTML object>
```

```
Saving HeadshotName.jpg to HeadshotName (3).jpg
```


```
# Task 2
import statsmodels.api as sm
```

```
mtcars_dataset = sm.datasets.get_rdataset("mtcars")
mtcars = mtcars_dataset.data

# Questions and Answers
# a. How many rows are there?
print(f"a. Number of rows: ", len(mtcars))

# b. How many columns are there?
print(f"b. Number of columns: ", len(mtcars.columns))

# c. What is the unit of the weight column?
print("c.\n------------------------------")
help(mtcars_dataset)
print(f"------------------------------\nUnit of weight column: lb\n")

# d. Show first 10 rows.
print(f"d. First 10 rows:\n", mtcars.head(10), "\n")

# e. Show every other row.
print(f"e. Every other row:\n", mtcars.iloc[::2], "\n")

# f. Show all rows where the number of cylinders is 4 or 6.
print(f"f. Rows where number of cylinders is 4 or 6:\n", mtcars[(mtcars["cyl"] ==
4) | (mtcars["cyl"] == 6)], "\n")

# g. Are there any NAs in the mpg column?
nasum = mtcars["mpg"].isna().sum()
if(nasum > 0):
  print(f"g. Yes, there are {nasum} NAs in the mpg column.")
else:
  print(f"g. No, there are no NAs in the mpg column.")

# h. What is the mean mpg value?
mean_mpg = mtcars["mpg"].mean()
print(f"h. Mean mpg value: {mean_mpg}")

# i. Show all rows where mpg is lower than the mean mpg value?
print(f"i. Rows where mpg is lower than the mean mpg value:\n",
mtcars[mtcars["mpg"] < mean_mpg], "\n")

# j. What is the horsepower of the car with the highest mpg?
maxmpg = mtcars["mpg"].idxmax()
print(f"j. The horsepower of the car with the highest mpg: {mtcars.loc[maxmpg,
'hp']}")
```

```
a. Number of rows:  32
b. Number of columns:  11
```

```
c.
------------------------------
Help on Dataset in module statsmodels.datasets.utils:

<class 'statsmodels.datasets.utils.Dataset'>
    .. container::

    .. container::

       ====== ===============
       mtcars R Documentation
       ====== ===============

       .. rubric:: Motor Trend Car Road Tests
          :name: motor-trend-car-road-tests

       .. rubric:: Description
          :name: description

       The data was extracted from the 1974 *Motor Trend* US magazine,
       and comprises fuel consumption and 10 aspects of automobile design
       and performance for 32 automobiles (1973-74 models).

       .. rubric:: Usage
          :name: usage

       .. code:: R

          mtcars

       .. rubric:: Format
          :name: format

       A data frame with 32 observations on 11 (numeric) variables.

       ===== ======== ========================================
       [, 1] ``mpg``  Miles/(US) gallon
       [, 2] ``cyl``  Number of cylinders
       [, 3] ``disp`` Displacement (cu.in.)
       [, 4] ``hp``   Gross horsepower
       [, 5] ``drat`` Rear axle ratio
       [, 6] ``wt``   Weight (1000 lbs)
       [, 7] ``qsec`` 1/4 mile time
       [, 8] ``vs``   Engine (0 = V-shaped, 1 = straight)
       [, 9] ``am``   Transmission (0 = automatic, 1 = manual)
       [,10] ``gear`` Number of forward gears
       [,11] ``carb`` Number of carburetors
       ===== ======== ========================================
```

```
        .. rubric:: Note
           :name: note

        Henderson and Velleman (1981) comment in a footnote to Table 1:
        'Hocking [original transcriber]'s noncrucial coding of the Mazda's
        rotary engine as a straight six-cylinder engine and the Porsche's
        flat engine as a V engine, as well as the inclusion of the diesel
        Mercedes 240D, have been retained to enable direct comparisons to
        be made with previous analyses.'

        .. rubric:: Source
           :name: source

        Henderson and Velleman (1981), Building multiple regression models
        interactively. *Biometrics*, **37**, 391-411.

        .. rubric:: Examples
           :name: examples

        .. code:: R

           require(graphics)
           pairs(mtcars, main = "mtcars data", gap = 1/4)
           coplot(mpg ~ disp | as.factor(cyl), data = mtcars,
                  panel = panel.smooth, rows = 1)
           ## possibly more meaningful, e.g., for summary() or bivariate plots:
           mtcars2 <- within(mtcars, {
              vs <- factor(vs, labels = c("V", "S"))
              am <- factor(am, labels = c("automatic", "manual"))
              cyl  <- ordered(cyl)
              gear <- ordered(gear)
              carb <- ordered(carb)
           })
           summary(mtcars2)

------------------------------
Unit of weight column: lb

d. First 10 rows:
                    mpg  cyl   disp   hp  drat     wt   qsec  vs  am  gear  \
rownames
Mazda RX4          21.0    6  160.0  110  3.90  2.620  16.46   0   1     4
Mazda RX4 Wag      21.0    6  160.0  110  3.90  2.875  17.02   0   1     4
Datsun 710         22.8    4  108.0   93  3.85  2.320  18.61   1   1     4
Hornet 4 Drive     21.4    6  258.0  110  3.08  3.215  19.44   1   0     3
Hornet Sportabout  18.7    8  360.0  175  3.15  3.440  17.02   0   0     3
Valiant            18.1    6  225.0  105  2.76  3.460  20.22   1   0     3
```

```
Duster 360         14.3    8  360.0  245  3.21  3.570  15.84   0   0     3
Merc 240D          24.4    4  146.7   62  3.69  3.190  20.00   1   0     4
Merc 230           22.8    4  140.8   95  3.92  3.150  22.90   1   0     4
Merc 280           19.2    6  167.6  123  3.92  3.440  18.30   1   0     4

                  carb
rownames
Mazda RX4            4
Mazda RX4 Wag        4
Datsun 710           1
Hornet 4 Drive       1
Hornet Sportabout    2
Valiant              1
Duster 360           4
Merc 240D            2
Merc 230             2
Merc 280             4
```

e. Every other row:

```
                     mpg  cyl   disp   hp  drat     wt   qsec  vs  am  gear  \
rownames
Mazda RX4           21.0    6  160.0  110  3.90  2.620  16.46   0   1     4
Datsun 710          22.8    4  108.0   93  3.85  2.320  18.61   1   1     4
Hornet Sportabout   18.7    8  360.0  175  3.15  3.440  17.02   0   0     3
Duster 360          14.3    8  360.0  245  3.21  3.570  15.84   0   0     3
Merc 230            22.8    4  140.8   95  3.92  3.150  22.90   1   0     4
Merc 280C           17.8    6  167.6  123  3.92  3.440  18.90   1   0     4
Merc 450SL          17.3    8  275.8  180  3.07  3.730  17.60   0   0     3
Cadillac Fleetwood  10.4    8  472.0  205  2.93  5.250  17.98   0   0     3
Chrysler Imperial   14.7    8  440.0  230  3.23  5.345  17.42   0   0     3
Honda Civic         30.4    4   75.7   52  4.93  1.615  18.52   1   1     4
Toyota Corona       21.5    4  120.1   97  3.70  2.465  20.01   1   0     3
AMC Javelin         15.2    8  304.0  150  3.15  3.435  17.30   0   0     3
Pontiac Firebird    19.2    8  400.0  175  3.08  3.845  17.05   0   0     3
Porsche 914-2       26.0    4  120.3   91  4.43  2.140  16.70   0   1     5
Ford Pantera L      15.8    8  351.0  264  4.22  3.170  14.50   0   1     5
Maserati Bora       15.0    8  301.0  335  3.54  3.570  14.60   0   1     5

                   carb
rownames
Mazda RX4             4
Datsun 710            1
Hornet Sportabout     2
Duster 360            4
Merc 230              2
Merc 280C             4
Merc 450SL            3
Cadillac Fleetwood    4
```

```
Chrysler Imperial      4
Honda Civic            2
Toyota Corona          1
AMC Javelin            2
Pontiac Firebird       2
Porsche 914-2          2
Ford Pantera L         4
Maserati Bora          8

f. Rows where number of cylinders is 4 or 6:
                  mpg  cyl   disp   hp  drat     wt   qsec  vs  am  gear  carb
rownames
Mazda RX4        21.0    6  160.0  110  3.90  2.620  16.46   0   1     4     4
Mazda RX4 Wag    21.0    6  160.0  110  3.90  2.875  17.02   0   1     4     4
Datsun 710       22.8    4  108.0   93  3.85  2.320  18.61   1   1     4     1
Hornet 4 Drive   21.4    6  258.0  110  3.08  3.215  19.44   1   0     3     1
Valiant          18.1    6  225.0  105  2.76  3.460  20.22   1   0     3     1
Merc 240D        24.4    4  146.7   62  3.69  3.190  20.00   1   0     4     2
Merc 230         22.8    4  140.8   95  3.92  3.150  22.90   1   0     4     2
Merc 280         19.2    6  167.6  123  3.92  3.440  18.30   1   0     4     4
Merc 280C        17.8    6  167.6  123  3.92  3.440  18.90   1   0     4     4
Fiat 128         32.4    4   78.7   66  4.08  2.200  19.47   1   1     4     1
Honda Civic      30.4    4   75.7   52  4.93  1.615  18.52   1   1     4     2
Toyota Corolla   33.9    4   71.1   65  4.22  1.835  19.90   1   1     4     1
Toyota Corona    21.5    4  120.1   97  3.70  2.465  20.01   1   0     3     1
Fiat X1-9        27.3    4   79.0   66  4.08  1.935  18.90   1   1     4     1
Porsche 914-2    26.0    4  120.3   91  4.43  2.140  16.70   0   1     5     2
Lotus Europa     30.4    4   95.1  113  3.77  1.513  16.90   1   1     5     2
Ferrari Dino     19.7    6  145.0  175  3.62  2.770  15.50   0   1     5     6
Volvo 142E       21.4    4  121.0  109  4.11  2.780  18.60   1   1     4     2

g. No, there are no NAs in the mpg column.
h. Mean mpg value: 20.090625000000003
i. Rows where mpg is lower than the mean mpg value:
                      mpg  cyl   disp   hp  drat     wt   qsec  vs  am  gear  \
rownames
Hornet Sportabout    18.7    8  360.0  175  3.15  3.440  17.02   0   0     3
Valiant              18.1    6  225.0  105  2.76  3.460  20.22   1   0     3
Duster 360           14.3    8  360.0  245  3.21  3.570  15.84   0   0     3
Merc 280             19.2    6  167.6  123  3.92  3.440  18.30   1   0     4
Merc 280C            17.8    6  167.6  123  3.92  3.440  18.90   1   0     4
Merc 450SE           16.4    8  275.8  180  3.07  4.070  17.40   0   0     3
Merc 450SL           17.3    8  275.8  180  3.07  3.730  17.60   0   0     3
Merc 450SLC          15.2    8  275.8  180  3.07  3.780  18.00   0   0     3
Cadillac Fleetwood   10.4    8  472.0  205  2.93  5.250  17.98   0   0     3
Lincoln Continental  10.4    8  460.0  215  3.00  5.424  17.82   0   0     3
Chrysler Imperial    14.7    8  440.0  230  3.23  5.345  17.42   0   0     3
Dodge Challenger     15.5    8  318.0  150  2.76  3.520  16.87   0   0     3
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```
AMC Javelin          15.2    8  304.0  150  3.15  3.435  17.30   0   0     3
Camaro Z28           13.3    8  350.0  245  3.73  3.840  15.41   0   0     3
Pontiac Firebird     19.2    8  400.0  175  3.08  3.845  17.05   0   0     3
Ford Pantera L       15.8    8  351.0  264  4.22  3.170  14.50   0   1     5
Ferrari Dino         19.7    6  145.0  175  3.62  2.770  15.50   0   1     5
Maserati Bora        15.0    8  301.0  335  3.54  3.570  14.60   0   1     5

                     carb
rownames
Hornet Sportabout       2
Valiant                 1
Duster 360              4
Merc 280                4
Merc 280C               4
Merc 450SE              3
Merc 450SL              3
Merc 450SLC             3
Cadillac Fleetwood      4
Lincoln Continental     4
Chrysler Imperial       4
Dodge Challenger        2
AMC Javelin             2
Camaro Z28              4
Pontiac Firebird        2
Ford Pantera L          4
Ferrari Dino            6
Maserati Bora           8
```

j. The horsepower of the car with the highest mpg: 65

```
# Task 3
#Stack Overflow (https://stackoverflow.com) is an active community where Python
and data science are frequently discussed. Users post questions related to all
aspects of Python, including troubleshooting code, understanding algorithms, and
choosing the right libraries for data science tasks. The community is highly
active, with questions often being answered within minutes. Users range from
beginners to experts in Python and data science, and the community is generally
friendly, although detailed, well-researched questions are more likely to receive
positive responses. It's a helpful space for newcomers, provided they follow
community guidelines and clearly explain their problems.
```