### April 15, 2024

```
[1]:
     import pandas as pd
     import numpy as np
[3]:
     df=pd.read_csv('Vehicles.csv')
[4]:
     df.head()
[4]:
                 id
                                                                       url
                     https://prescott.craigslist.org/cto/d/prescott...
        7222695916
        7218891961
                     https://fayar.craigslist.org/ctd/d/bentonville...
     1
                     https://keys.craigslist.org/cto/d/summerland-k...
     2
       7221797935
     3
        7222270760
                     https://worcester.craigslist.org/cto/d/west-br...
        7210384030
                     https://greensboro.craigslist.org/cto/d/trinit...
                          region
                                                           region_url
                                                                        price
                                                                                year
     0
                       prescott
                                    https://prescott.craigslist.org
                                                                          6000
                                                                                 NaN
                                        https://fayar.craigslist.org
     1
                   fayetteville
                                                                        11900
                                                                                 NaN
                   florida keys
                                         https://keys.craigslist.org
     2
                                                                        21000
                                                                                 NaN
                                   https://worcester.craigslist.org
     3
        worcester / central MA
                                                                          1500
                                                                                 NaN
     4
                                  https://greensboro.craigslist.org
                                                                          4900
                     greensboro
                                                                                 NaN
       manufacturer model condition cylinders
                                                           type paint_color
                                                   ... size
     0
                       NaN
                                  NaN
                                                            NaN
                                                                               \
                 NaN
                                             NaN
                                                      NaN
                                                                          NaN
     1
                 NaN
                       NaN
                                  NaN
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                 NaN
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     3
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                                                                          NaN
     4
                 NaN
                       NaN
                                  NaN
                                             NaN
                                                      NaN
                                                            NaN
                                                                          NaN
       image_url description county state lat long posting_date
     0
             NaN
                           NaN
                                  NaN
                                          az NaN
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                                                                 NaN
     1
             NaN
                           NaN
                                  NaN
                                          ar NaN
                                                                 NaN
                                                   NaN
     2
             NaN
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                                          fl NaN
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     3
             NaN
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                                          ma NaN
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             NaN
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                                  NaN
                                          nc NaN
                                                  NaN
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```

```
[5]:
     df.tail()
[5]:
                    id
                                                                             region
                                                                         url
           7308972392
     1996
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                                                                            dothan
     1997
           7308971633
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                                                                            dothan
     1998
           7308831024
                        https://dothan.craigslist.org/ctd/d/dothan-201...
                                                                            dothan
     1999
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                                                                            dothan
           7308801755
     2000
           7308801682
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                                                                            dothan
                               region_url
                                            price
                                                      year manufacturer
     1996
           https://dothan.craigslist.org
                                            17860
                                                    2014.0
                                                                    jeep
     1997
           https://dothan.craigslist.org
                                            54488
                                                    2020.0
                                                                    ford
           https://dothan.craigslist.org
     1998
                                            33990
                                                    2017.0
                                                                     ram
     1999
           https://dothan.craigslist.org
                                                3
                                                    2020.0
                                                                    ford
     2000
           https://dothan.craigslist.org
                                           18681
                                                   2019.0
                                                                 nissan
                              model condition
                                                   cylinders
                                                              ... size
                                                                         type
     1996
            grand cherokee limited
                                           NaN
                                                         NaN
                                                                 NaN
                                                                          NaN
     1997
                   f-150 lariat 4wd
                                           NaN
                                                         NaN
                                                                 NaN
                                                                          NaN
     1998
           1500 crew cab tradesman
                                          good
                                                8 cylinders
                                                                 NaN
                                                                       pickup
     1999
                    fusion se sedan
                                           NaN
                                                         NaN
                                                                  NaN
                                                                          NaN
     2000
                altima 2.5 sr sedan
                                           NaN
                                                         NaN
                                                                 NaN
                                                                          NaN
          paint_color
                                                                   image_url
     1996
                        https://images.craigslist.org/00000_ijP2Qx9vMi...
                   {\tt NaN}
                        https://images.craigslist.org/00U0U dTOexEOB21...
     1997
                  {\tt NaN}
     1998
                        https://images.craigslist.org/00Y0Y jRbwm0dSjS...
                  blue
     1999
                  {\tt NaN}
                        https://images.craigslist.org/00E0E_b3RHuW4jYv...
     2000
                  NaN
                        https://images.craigslist.org/00101_lBMiBbuKBr...
                                                    description county state
     1996
           2014 JEEP GRAND CHEROKEE LIMITED ~ Hundreds of...
                                                                 NaN
                                                                         al
     1997
           2020 FORD F-150 LARIAT 4WD / F150 4X4 TRUCK ~ ...
                                                                 NaN
                                                                         al
     1998 Carvana is the safer way to buy a car During t...
                                                                 NaN
                                                                         al
     1999
           2020 FORD FUSION SE SEDAN ~ Hundreds of NEW & ...
                                                                 NaN
                                                                         al
     2000
           2019 NISSAN ALTIMA 2.5 SR SEDAN ~ Hundreds of ...
                                                                  NaN
                 lat
                            long
                                               posting_date
     1996
           29.801374 -82.531052
                                   2021-04-18T17:15:59-0500
           29.802119 -82.529850
     1997
                                   2021-04-18T17:14:22-0500
     1998
           31.230000 -85.400000
                                   2021-04-18T12:50:51-0500
     1999
           29.803337 -82.528074
                                   2021-04-18T11:59:35-0500
     2000
           29.802566 -82.529678
                                  2021-04-18T11:59:27-0500
     [5 rows x 26 columns]
```

[6]:

df.info

```
[6]: <bound method DataFrame.info of
                                                      id
     url
     0
                        https://prescott.craigslist.org/cto/d/prescott...
           7222695916
     1
                        https://fayar.craigslist.org/ctd/d/bentonville...
           7218891961
     2
                        https://keys.craigslist.org/cto/d/summerland-k...
           7221797935
     3
           7222270760
                        https://worcester.craigslist.org/cto/d/west-br...
     4
           7210384030
                        https://greensboro.craigslist.org/cto/d/trinit...
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     1996
           7308972392
     1997
           7308971633
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                        https://dothan.craigslist.org/ctd/d/dothan-201...
     1998
           7308831024
     1999
                        https://dothan.craigslist.org/ctd/d/alachua-20...
           7308801755
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     2000
           7308801682
                            region
                                                              region_url
                                                                           price
     0
                                       https://prescott.craigslist.org
                                                                            6000
                          prescott
     1
                      fayetteville
                                          https://fayar.craigslist.org
                                                                           11900
     2
                                           https://keys.craigslist.org
                      florida keys
                                                                           21000
     3
           worcester / central MA
                                      https://worcester.craigslist.org
                                                                            1500
     4
                        greensboro
                                     https://greensboro.craigslist.org
                                                                            4900
     1996
                             dothan
                                         https://dothan.craigslist.org
                                                                           17860
     1997
                             dothan
                                         https://dothan.craigslist.org
                                                                           54488
                                         https://dothan.craigslist.org
     1998
                             dothan
                                                                           33990
     1999
                                         https://dothan.craigslist.org
                                                                               3
                             dothan
     2000
                                         https://dothan.craigslist.org
                                                                           18681
                             dothan
             year manufacturer
                                                     model condition
                                                                          cylinders
     0
              NaN
                             NaN
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                                                                                NaN
     1996
           2014.0
                                   grand cherokee limited
                                                                  NaN
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                            jeep
     1997
           2020.0
                           ford
                                         f-150 lariat 4wd
                                                                  NaN
                                                                                NaN
     1998
           2017.0
                             ram
                                  1500 crew cab tradesman
                                                                 good
                                                                        8 cylinders
     1999
           2020.0
                                          fusion se sedan
                                                                  NaN
                                                                                NaN
                            ford
     2000
           2019.0
                                      altima 2.5 sr sedan
                                                                                NaN
                         nissan
                                                                  NaN
           … size
                      type paint_color
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                       NaN
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1996
         NaN
                  NaN
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         NaN
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1998
         NaN
               pickup
                              blue
1999
         NaN
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                               NaN
2000
         NaN
                  NaN
                               NaN
                                                  image_url
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                                                              /
1
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2
                                                        NaN
3
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4
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1996
      https://images.craigslist.org/00000_ijP2Qx9vMi...
      https://images.craigslist.org/00U0U_dTOexEOB21...
1997
      https://images.craigslist.org/00Y0Y_jRbwm0dSjS...
1998
1999
      https://images.craigslist.org/00E0E_b3RHuW4jYv...
2000
      https://images.craigslist.org/00101_lBMiBbuKBr...
                                                description county state
0
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4
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1996
      2014 JEEP GRAND CHEROKEE LIMITED ~ Hundreds of...
                                                              NaN
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1997
      2020 FORD F-150 LARIAT 4WD / F150 4X4 TRUCK ~ ...
                                                              {\tt NaN}
                                                                     al
1998
      Carvana is the safer way to buy a car During t...
                                                              NaN
                                                                      al
1999
      2020 FORD FUSION SE SEDAN ~ Hundreds of NEW & ...
                                                              NaN
                                                                      al
      2019 NISSAN ALTIMA 2.5 SR SEDAN ~ Hundreds of ...
2000
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             lat
                        long
                                           posting_date
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      29.801374 -82.531052
                              2021-04-18T17:15:59-0500
1996
      29.802119 -82.529850
                              2021-04-18T17:14:22-0500
1997
1998
      31.230000 -85.400000
                              2021-04-18T12:50:51-0500
1999
      29.803337 -82.528074
                              2021-04-18T11:59:35-0500
2000
      29.802566 -82.529678
                              2021-04-18T11:59:27-0500
```

[2001 rows x 26 columns]>

#### [7]: df.describe

```
[7]: <bound method NDFrame.describe of
                                                         id
     url
     0
           7222695916
                        https://prescott.craigslist.org/cto/d/prescott...
                        https://fayar.craigslist.org/ctd/d/bentonville...
     1
           7218891961
     2
           7221797935
                        https://keys.craigslist.org/cto/d/summerland-k...
     3
           7222270760
                        https://worcester.craigslist.org/cto/d/west-br...
     4
           7210384030
                        https://greensboro.craigslist.org/cto/d/trinit...
           7308972392
     1996
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     1997
           7308971633
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                        https://dothan.craigslist.org/ctd/d/dothan-201...
     1998
           7308831024
     1999
           7308801755
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     2000
           7308801682
                        https://dothan.craigslist.org/ctd/d/alachua-20...
                            region
                                                              region_url
                                                                           price
     0
                          prescott
                                       https://prescott.craigslist.org
                                                                            6000
     1
                                           https://fayar.craigslist.org
                      fayetteville
                                                                           11900
     2
                                            https://keys.craigslist.org
                                                                           21000
                      florida keys
     3
           worcester / central MA
                                      https://worcester.craigslist.org
                                                                            1500
     4
                                     https://greensboro.craigslist.org
                                                                            4900
                        greensboro
                             dothan
     1996
                                         https://dothan.craigslist.org
                                                                           17860
     1997
                                         https://dothan.craigslist.org
                             dothan
                                                                           54488
                                         https://dothan.craigslist.org
                                                                           33990
     1998
                             dothan
     1999
                                         https://dothan.craigslist.org
                                                                               3
                             dothan
     2000
                             dothan
                                         https://dothan.craigslist.org
             year manufacturer
                                                     model condition
                                                                          cylinders
     0
              NaN
                            NaN
                                                       NaN
                                                                  NaN
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     1996
           2014.0
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                            jeep
                                   grand cherokee limited
                                                                                NaN
     1997
           2020.0
                            ford
                                         f-150 lariat 4wd
                                                                  NaN
     1998
           2017.0
                                  1500 crew cab tradesman
                             ram
                                                                 good
                                                                        8 cylinders
     1999
           2020.0
                                           fusion se sedan
                           ford
                                                                  NaN
                                                                                NaN
     2000
           2019.0
                                      altima 2.5 sr sedan
                                                                  NaN
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                         nissan
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                      type paint_color
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4
                  NaN
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1996
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1997
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               pickup
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0
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1
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2
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3
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4
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1996
      https://images.craigslist.org/00000_ijP2Qx9vMi...
1997
      https://images.craigslist.org/00U0U_dTOexEOB21...
1998
      https://images.craigslist.org/00Y0Y_jRbwm0dSjS...
1999
      https://images.craigslist.org/00E0E_b3RHuW4jYv...
2000
      https://images.craigslist.org/00101_lBMiBbuKBr...
                                               description county state
0
                                                        NaN
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2
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                                                               NaN
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1996
      2014 JEEP GRAND CHEROKEE LIMITED ~ Hundreds of...
                                                             NaN
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      2020 FORD F-150 LARIAT 4WD / F150 4X4 TRUCK ~ ...
1997
                                                             NaN
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1998
      Carvana is the safer way to buy a car During t...
                                                             NaN
                                                                     al
      2020 FORD FUSION SE SEDAN ~ Hundreds of NEW & ...
1999
                                                             NaN
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2000
      2019 NISSAN ALTIMA 2.5 SR SEDAN ~ Hundreds of ...
                                                             NaN
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0
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2
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3
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4
                        NaN
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1996
      29.801374 -82.531052
                              2021-04-18T17:15:59-0500
1997
      29.802119 -82.529850
                              2021-04-18T17:14:22-0500
1998
      31.230000 -85.400000
                              2021-04-18T12:50:51-0500
1999
      29.803337 -82.528074
                              2021-04-18T11:59:35-0500
2000
      29.802566 -82.529678
                              2021-04-18T11:59:27-0500
```

# [8]: df.isnull url 0 1

```
[8]: <bound method DataFrame.isnull of
                                                         id
                        https://prescott.craigslist.org/cto/d/prescott... \
           7222695916
                        https://fayar.craigslist.org/ctd/d/bentonville...
           7218891961
     2
           7221797935
                        https://keys.craigslist.org/cto/d/summerland-k...
     3
           7222270760
                        https://worcester.craigslist.org/cto/d/west-br...
     4
           7210384030
                        https://greensboro.craigslist.org/cto/d/trinit...
     1996
           7308972392
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     1997
                        https://dothan.craigslist.org/ctd/d/alachua-20...
           7308971633
     1998
                        https://dothan.craigslist.org/ctd/d/dothan-201...
           7308831024
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     1999
           7308801755
                        https://dothan.craigslist.org/ctd/d/alachua-20...
     2000
           7308801682
                            region
                                                              region_url
                                                                           price
     0
                                       https://prescott.craigslist.org
                          prescott
                                                                            6000
     1
                      fayetteville
                                          https://fayar.craigslist.org
                                                                           11900
     2
                                           https://keys.craigslist.org
                      florida keys
                                                                           21000
     3
           worcester / central MA
                                      https://worcester.craigslist.org
                                                                            1500
     4
                                     https://greensboro.craigslist.org
                                                                            4900
                        greensboro
     •••
     1996
                             dothan
                                         https://dothan.craigslist.org
                                                                           17860
                                         https://dothan.craigslist.org
     1997
                             dothan
                                                                           54488
     1998
                             dothan
                                         https://dothan.craigslist.org
                                                                           33990
     1999
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                             dothan
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                             dothan
                                         https://dothan.craigslist.org
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             year manufacturer
                                                     model condition
                                                                          cylinders
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     1996
           2014.0
                                   grand cherokee limited
                                                                  NaN
                                                                                NaN
                            jeep
     1997
           2020.0
                                         f-150 lariat 4wd
                                                                                NaN
                            ford
                                                                  NaN
     1998
                                  1500 crew cab tradesman
           2017.0
                            ram
                                                                 good
                                                                       8 cylinders
     1999
           2020.0
                           ford
                                           fusion se sedan
                                                                  NaN
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     2000
           2019.0
                                      altima 2.5 sr sedan
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                         nissan
                      type paint_color
           ... size
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4
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1996
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1997
         NaN
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                               NaN
1998
                              blue
         {\tt NaN}
               pickup
1999
         NaN
                  NaN
                               NaN
2000
         NaN
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                                                  image_url
0
                                                         NaN
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1
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2
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3
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4
                                                         NaN
      https://images.craigslist.org/00000_ijP2Qx9vMi...
1996
1997
      https://images.craigslist.org/00U0U_dTOexEOB21...
1998
      https://images.craigslist.org/00Y0Y_jRbwm0dSjS...
1999
      https://images.craigslist.org/00E0E_b3RHuW4jYv...
2000
      https://images.craigslist.org/00101_lBMiBbuKBr...
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4
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                                                                        nc
1996
      2014 JEEP GRAND CHEROKEE LIMITED ~ Hundreds of...
                                                              NaN
                                                                      al
      2020 FORD F-150 LARIAT 4WD / F150 4X4 TRUCK ~ ...
1997
                                                              NaN
                                                                      al
      Carvana is the safer way to buy a car During t...
1998
                                                              NaN
                                                                      al
1999
      2020 FORD FUSION SE SEDAN ~ Hundreds of NEW & ...
                                                              NaN
                                                                      al
2000
      2019 NISSAN ALTIMA 2.5 SR SEDAN ~ Hundreds of ...
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             lat
                        long
                                           posting_date
0
             NaN
                         NaN
                                                     NaN
1
             NaN
                         NaN
                                                     NaN
2
             NaN
                         NaN
                                                     NaN
3
             NaN
                         NaN
                                                     NaN
4
             NaN
                         NaN
                                                     NaN
      29.801374 -82.531052
1996
                              2021-04-18T17:15:59-0500
1997
      29.802119 -82.529850
                              2021-04-18T17:14:22-0500
1998
      31.230000 -85.400000
                              2021-04-18T12:50:51-0500
1999
                              2021-04-18T11:59:35-0500
      29.803337 -82.528074
```

[2001 rows x 26 columns]>

#### [9]: df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2001 entries, 0 to 2000
Data columns (total 26 columns):

#	Column	Non-Null Count	Dtype	
0	 id	2001 non-null	 int64	
1	url	2001 non-null		
_			object	
2	region	2001 non-null	object	
3	region_url	2001 non-null	object	
4	price	2001 non-null	int64	
5	year	1952 non-null	float64	
6	manufacturer	1831 non-null	object	
7	model	1961 non-null	object	
8	condition	1122 non-null	object	
9	cylinders	1258 non-null	object	
10	fuel	1940 non-null	object	
11	odometer	1962 non-null	float64	
12	title_status	1871 non-null	object	
13	transmission	1973 non-null	object	
14	VIN	1268 non-null	object	
15	drive	1363 non-null	object	
16	size	493 non-null	object	
17	type	1380 non-null	object	
18	paint_color	1534 non-null	object	
19	image_url	1974 non-null	object	
20	description	1974 non-null	object	
21	county	0 non-null	float64	
22	state	2001 non-null	object	
23	lat	1962 non-null	float64	
24	long	1962 non-null	float64	
25	posting_date		object	
dtypes: float64(5), int64(2), object(19)				
memory usage: 406.6+ KB				
	J			

## [10]: df.describe()

[10]: id price odometer county year 2.001000e+03 2.001000e+03 1952.000000 1.962000e+03 0.0 count 7.308532e+09 5.625151e+05 2011.201332 2.038947e+05 NaN mean 2.219042e+07 std 1.150144e+07 9.704075 9.915782e+05 NaN 7.208550e+09 0.000000e+00 1903.000000 0.000000e+00 NaN min

```
50%
             7.310397e+09
                            1.720000e+04
                                                         8.799700e+04
                                                                           NaN
                                           2013.000000
      75%
             7.313504e+09
                            2.998000e+04
                                           2017.000000
                                                         1.572288e+05
                                                                           NaN
             7.316878e+09
                            9.876543e+08
                                           2021.000000
                                                         9.99999e+06
                                                                           NaN
      max
                      lat
                                   long
             1962.000000
                           1962.000000
      count
               33.735365
                            -85.549365
      mean
                 2.167945
                              3.375666
      std
      min
               26.021800
                           -122.693000
      25%
               32.922900
                            -86.817617
      50%
               33.455361
                            -86.737847
      75%
               33.736288
                            -85.480000
      max
               44.120200
                            -73.572300
      df.isnull
[11]:
[11]: <bound method DataFrame.isnull of
                                                         id
      url
      0
            7222695916
                         https://prescott.craigslist.org/cto/d/prescott...
      1
                         https://fayar.craigslist.org/ctd/d/bentonville...
            7218891961
      2
                         https://keys.craigslist.org/cto/d/summerland-k...
            7221797935
      3
            7222270760
                         https://worcester.craigslist.org/cto/d/west-br...
      4
                         https://greensboro.craigslist.org/cto/d/trinit...
            7210384030
      1996
            7308972392
                         https://dothan.craigslist.org/ctd/d/alachua-20...
                         https://dothan.craigslist.org/ctd/d/alachua-20...
      1997
            7308971633
      1998
            7308831024
                         https://dothan.craigslist.org/ctd/d/dothan-201...
      1999
                         https://dothan.craigslist.org/ctd/d/alachua-20...
            7308801755
      2000
                         https://dothan.craigslist.org/ctd/d/alachua-20...
            7308801682
                             region
                                                              region_url
                                                                           price
      0
                                        https://prescott.craigslist.org
                           prescott
                                                                            6000
      1
                       fayetteville
                                           https://fayar.craigslist.org
                                                                           11900
      2
                       florida keys
                                            https://keys.craigslist.org
                                                                           21000
      3
            worcester / central MA
                                       https://worcester.craigslist.org
                                                                            1500
      4
                                      https://greensboro.craigslist.org
                                                                            4900
                         greensboro
      1996
                             dothan
                                          https://dothan.craigslist.org
                                                                           17860
      1997
                             dothan
                                          https://dothan.craigslist.org
                                                                           54488
      1998
                                          https://dothan.craigslist.org
                                                                           33990
                             dothan
                                          https://dothan.craigslist.org
      1999
                             dothan
                                                                               3
      2000
                             dothan
                                          https://dothan.craigslist.org
                                                                           18681
                                                      model condition
              year manufacturer
                                                                          cylinders
      0
               NaN
                                                        NaN
                                                                  NaN
                                                                                NaN
                                                                                     \
                             NaN
      1
               NaN
                                                                  NaN
                             NaN
                                                        NaN
                                                                                NaN
```

25%

7.305754e+09

5.500000e+03

2008.000000

2.967350e+04

NaN

```
2
         NaN
                        NaN
                                                    NaN
                                                               NaN
                                                                              NaN
3
         NaN
                        {\tt NaN}
                                                    NaN
                                                               NaN
                                                                              NaN
4
         NaN
                        NaN
                                                    NaN
                                                               NaN
                                                                              NaN
1996
                                                                              NaN
      2014.0
                               grand cherokee limited
                                                               NaN
                       jeep
1997
      2020.0
                                     f-150 lariat 4wd
                                                               NaN
                                                                              NaN
                       ford
1998
      2017.0
                        ram
                              1500 crew cab tradesman
                                                              good
                                                                     8 cylinders
1999
      2020.0
                       ford
                                       fusion se sedan
                                                               NaN
                                                                              NaN
2000
                                  altima 2.5 sr sedan
                                                                              NaN
      2019.0
                                                               NaN
                     nissan
      ... size
                 type paint_color
0
         NaN
                  NaN
                                NaN
                                     \
1
         NaN
                  NaN
                                NaN
2
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3
         NaN
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4
         NaN
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                                NaN
                                NaN
1996
         NaN
                  NaN
1997
         NaN
                  NaN
                                NaN
1998
         NaN
                               blue
               pickup
1999
                                NaN
         NaN
                  NaN
2000
         NaN
                  NaN
                                NaN
                                                   image_url
0
                                                          NaN
                                                               \
1
                                                          NaN
2
                                                          NaN
3
                                                         NaN
4
                                                          NaN
      https://images.craigslist.org/00000_ijP2Qx9vMi...
1996
      https://images.craigslist.org/00U0U_dTOexEOB21...
1997
      https://images.craigslist.org/00Y0Y_jRbwm0dSjS...
1998
      https://images.craigslist.org/00E0E_b3RHuW4jYv...
1999
2000
      https://images.craigslist.org/00101_lBMiBbuKBr...
                                                description county state
0
                                                          NaN
                                                                 NaN
                                                                         az
1
                                                          NaN
                                                                 NaN
                                                                         ar
2
                                                          NaN
                                                                 NaN
                                                                         fl
3
                                                                 NaN
                                                          NaN
                                                                         ma
4
                                                          NaN
                                                                 NaN
                                                                         nc
1996
      2014 JEEP GRAND CHEROKEE LIMITED ~ Hundreds of...
                                                               {\tt NaN}
                                                                       al
      2020 FORD F-150 LARIAT 4WD / F150 4X4 TRUCK ~ ...
1997
                                                               NaN
                                                                       al
1998
      Carvana is the safer way to buy a car During t...
                                                               NaN
                                                                       al
1999
      2020 FORD FUSION SE SEDAN ~ Hundreds of NEW & ...
                                                               NaN
                                                                       al
```

```
lat
                             long
                                               posting_date
                              NaN
      0
                  NaN
                                                         NaN
      1
                  NaN
                              NaN
                                                         NaN
      2
                  NaN
                              NaN
                                                         NaN
      3
                  NaN
                              NaN
                                                         NaN
      4
                  NaN
                              NaN
                                                         NaN
            29.801374 -82.531052
                                   2021-04-18T17:15:59-0500
      1996
            29.802119 -82.529850
      1997
                                   2021-04-18T17:14:22-0500
      1998 31.230000 -85.400000
                                  2021-04-18T12:50:51-0500
      1999
            29.803337 -82.528074 2021-04-18T11:59:35-0500
      2000 29.802566 -82.529678 2021-04-18T11:59:27-0500
      [2001 rows x 26 columns]>
[12]: df.columns
[12]: Index(['id', 'url', 'region', 'region_url', 'price', 'year', 'manufacturer',
             'model', 'condition', 'cylinders', 'fuel', 'odometer', 'title_status',
             'transmission', 'VIN', 'drive', 'size', 'type', 'paint_color',
             'image_url', 'description', 'county', 'state', 'lat', 'long',
             'posting_date'],
            dtype='object')
      data=['id','region']
[13]:
Γ14]:
      data
[14]: ['id', 'region']
[15]:
      df [data]
[15]:
                    id
                                         region
      0
            7222695916
                                       prescott
      1
            7218891961
                                   fayetteville
      2
            7221797935
                                   florida keys
      3
            7222270760
                        worcester / central MA
      4
            7210384030
                                     greensboro
      1996
           7308972392
                                         dothan
      1997
                                         dothan
            7308971633
      1998
            7308831024
                                         dothan
      1999
            7308801755
                                         dothan
      2000 7308801682
                                         dothan
```

 ${\tt NaN}$ 

al

2000 2019 NISSAN ALTIMA 2.5 SR SEDAN ~ Hundreds of ...

## [2001 rows x 2 columns]

```
[16]: df.size
[16]: 52026
[17]: df [data] .head()
[17]:
                id
                                    region
     0 7222695916
                                  prescott
      1 7218891961
                              fayetteville
      2 7221797935
                              florida keys
      3 7222270760 worcester / central MA
      4 7210384030
                                greensboro
[18]: df[data].tail()
[18]:
                   id region
                       dothan
      1996 7308972392
      1997 7308971633
                       dothan
      1998 7308831024
                       dothan
      1999 7308801755
                       dothan
      2000 7308801682 dothan
 []:
```