Brian_Reppeto540Week7_8

February 3, 2024

DSC 540 Week 7&8 Data Wrangling with Python:

Chapter 7

Author: Brian Reppeto 1/25/2024

```python
[36]: # import libraries

      import pandas as pd
```

```python
[37]: # read candy file

      candy_df=pd.read_excel("BOING-BOING-CANDY-HIERARCHY-2016-SURVEY-Responses.xlsx")
```

```python
[38]: # head the new DF

      candy_df.head()
```

```
[38]:                 Timestamp  \
      0 2016-10-24 05:09:23.033
      1 2016-10-24 05:09:54.798
      2 2016-10-24 05:13:06.734
      3 2016-10-24 05:14:17.192
      4 2016-10-24 05:14:24.625

        Are you going actually going trick or treating yourself? Your gender:  \
      0                                                 No              Male
      1                                                 No              Male
      2                                                 No            Female
      3                                                 No              Male
      4                                                Yes              Male

        How old are you? Which country do you live in?  \
      0               22                         Canada
      1               45                            usa
      2               48                             US
      3               57                            usa
      4               42                            USA
```

1

```
   Which state, province, county do you live in?  [100 Grand Bar]  \
0                                         Ontario              JOY
1                                              il              MEH
2                                        Colorado              JOY
3                                              il              JOY
4                                    South Dakota              MEH


   [Anonymous brown globs that come in black and orange wrappers]  \
0                                            DESPAIR
1                                                MEH
2                                            DESPAIR
3                                                MEH
4                                            DESPAIR


   [Any full-sized candy bar]  [Black Jacks]  … \
0                          JOY            MEH  …
1                          JOY            JOY  …
2                          JOY            MEH  …
3                          JOY            MEH  …
4                          JOY        DESPAIR  …


  Please estimate the degree(s) of separation you have from the following
celebrities [JK Rowling]  \
0                                     3 or higher
1                                     3 or higher
2                                     3 or higher
3                                     3 or higher
4                                     3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [JJ Abrams]  \
0                                               2
1                                     3 or higher
2                                     3 or higher
3                                     3 or higher
4                                     3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [Beyoncé]  \
0                                     3 or higher
1                                     3 or higher
2                                     3 or higher
3                                     3 or higher
4                                     3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [Bieber]  \
```

```
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

   Please estimate the degree(s) of separation you have from the following
celebrities [Kevin Bacon]   \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

   Please estimate the degree(s) of separation you have from the following
celebrities [Francis Bacon (1561 - 1626)]   \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

   Which day do you prefer, Friday or Sunday?   \
0                                       Friday
1                                       Friday
2                                       Sunday
3                                       Sunday
4                                       Friday

   Do you eat apples the correct way, East to West (side to side) or do you eat
them like a freak of nature, South to North (bottom to top)?   \
0                                  South to North
1                                    East to West
2                                    East to West
3                                  South to North
4                                    East to West

   When you see the above image of the 4 different websites, which one would you
most likely check out (please be honest).   \
0                Science: Latest News and Headlines
1                Science: Latest News and Headlines
2                Science: Latest News and Headlines
3                Science: Latest News and Headlines
4                                             ESPN

   [York Peppermint Patties] Ignore
0                               NaN
```

```
1                                    NaN
2                                    NaN
3                                    NaN
4                                    NaN
```

[5 rows x 123 columns]

Chapter 7

```
[39]: # fill in missing data

      df_cleaned=candy_df.fillna(value=pd.NA)
```

```
[40]: # head the new DF

      df_cleaned.head()
```

[40]:   Timestamp \
      0 2016-10-24 05:09:23.033
      1 2016-10-24 05:09:54.798
      2 2016-10-24 05:13:06.734
      3 2016-10-24 05:14:17.192
      4 2016-10-24 05:14:24.625

         Are you going actually going trick or treating yourself? Your gender: \
      0   No   Male
      1   No   Male
      2   No   Female
      3   No   Male
      4   Yes   Male

         How old are you? Which country do you live in? \
      0   22   Canada
      1   45   usa
      2   48   US
      3   57   usa
      4   42   USA

         Which state, province, county do you live in? [100 Grand Bar] \
      0   Ontario   JOY
      1   il   MEH
      2   Colorado   JOY
      3   il   JOY
      4   South Dakota   MEH

          [Anonymous brown globs that come in black and orange wrappers] \
      0   DESPAIR
      1   MEH

4

```
2                                             DESPAIR
3                                                 MEH
4                                             DESPAIR


   [Any full-sized candy bar]  [Black Jacks]  …  \
0                         JOY          MEH  …
1                         JOY          JOY  …
2                         JOY          MEH  …
3                         JOY          MEH  …
4                         JOY      DESPAIR  …


  Please estimate the degree(s) of separation you have from the following
celebrities [JK Rowling]  \
0                                  3 or higher
1                                  3 or higher
2                                  3 or higher
3                                  3 or higher
4                                  3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [JJ Abrams]  \
0                                            2
1                                  3 or higher
2                                  3 or higher
3                                  3 or higher
4                                  3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [Beyoncé]  \
0                                  3 or higher
1                                  3 or higher
2                                  3 or higher
3                                  3 or higher
4                                  3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [Bieber]  \
0                                  3 or higher
1                                  3 or higher
2                                  3 or higher
3                                  3 or higher
4                                  3 or higher


  Please estimate the degree(s) of separation you have from the following
celebrities [Kevin Bacon]  \
0                                  3 or higher
1                                  3 or higher
```

```
2                                                     3 or higher
3                                                     3 or higher
4                                                     3 or higher

   Please estimate the degree(s) of separation you have from the following
celebrities [Francis Bacon (1561 - 1626)]  \
0                                                     3 or higher
1                                                     3 or higher
2                                                     3 or higher
3                                                     3 or higher
4                                                     3 or higher

   Which day do you prefer, Friday or Sunday?  \
0                                                Friday
1                                                Friday
2                                                Sunday
3                                                Sunday
4                                                Friday

   Do you eat apples the correct way, East to West (side to side) or do you eat
them like a freak of nature, South to North (bottom to top)?  \
0                                           South to North
1                                             East to West
2                                             East to West
3                                           South to North
4                                             East to West

   When you see the above image of the 4 different websites, which one would you
most likely check out (please be honest).  \
0                  Science: Latest News and Headlines
1                  Science: Latest News and Headlines
2                  Science: Latest News and Headlines
3                  Science: Latest News and Headlines
4                                                ESPN

     [York Peppermint Patties] Ignore
0                                 NaN
1                                 NaN
2                                 NaN
3                                 NaN
4                                 NaN

[5 rows x 123 columns]
```

[41]:
```python
# convert all words to lowercase ---- Replace values

df_lower=df_cleaned.applymap(lambda x: x.lower() if isinstance(x, str) else x)
```

```
[42]: # head the new DF

      df_lower.head()
```

[42]:   Timestamp \
      0 2016-10-24 05:09:23.033
      1 2016-10-24 05:09:54.798
      2 2016-10-24 05:13:06.734
      3 2016-10-24 05:14:17.192
      4 2016-10-24 05:14:24.625

        Are you going actually going trick or treating yourself? Your gender: \
      0   no   male
      1   no   male
      2   no   female
      3   no   male
      4   yes   male

        How old are you? Which country do you live in? \
      0   22   canada
      1   45   usa
      2   48   us
      3   57   usa
      4   42   usa

        Which state, province, county do you live in? [100 Grand Bar] \
      0   ontario   joy
      1   il   meh
      2   colorado   joy
      3   il   joy
      4   south dakota   meh

          [Anonymous brown globs that come in black and orange wrappers] \
      0   despair
      1   meh
      2   despair
      3   meh
      4   despair

          [Any full-sized candy bar] [Black Jacks] … \
      0   joy   meh …
      1   joy   joy …
      2   joy   meh …
      3   joy   meh …
      4   joy   despair …

        Please estimate the degree(s) of separation you have from the following
```

```
celebrities [JK Rowling]  \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

  Please estimate the degree(s) of separation you have from the following
celebrities [JJ Abrams]  \
0                                                 2
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

  Please estimate the degree(s) of separation you have from the following
celebrities [Beyoncé]  \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

  Please estimate the degree(s) of separation you have from the following
celebrities [Bieber]  \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

  Please estimate the degree(s) of separation you have from the following
celebrities [Kevin Bacon]  \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher

  Please estimate the degree(s) of separation you have from the following
celebrities [Francis Bacon (1561 - 1626)]  \
0                                       3 or higher
1                                       3 or higher
2                                       3 or higher
3                                       3 or higher
4                                       3 or higher
```

```
   Which day do you prefer, Friday or Sunday?  \
0                                        friday
1                                        friday
2                                        sunday
3                                        sunday
4                                        friday

   Do you eat apples the correct way, East to West (side to side) or do you eat
them like a freak of nature, South to North (bottom to top)?  \
0                                        south to north
1                                          east to west
2                                          east to west
3                                        south to north
4                                          east to west

   When you see the above image of the 4 different websites, which one would you
most likely check out (please be honest).  \
0               science: latest news and headlines
1               science: latest news and headlines
2               science: latest news and headlines
3               science: latest news and headlines
4                                              espn

    [York Peppermint Patties] Ignore
0                                 NaN
1                                 NaN
2                                 NaN
3                                 NaN
4                                 NaN

[5 rows x 123 columns]
```

[43]: `# drop multiple columns`

```
columns_to_drop = [' [Person of Interest Season 3 DVD Box Set (not including
↪Disc 4 with hilarious outtakes)]','Please list any items not included above
↪that give you JOY.','Please list any items not included above that give you
↪DESPAIR.','Please leave any witty, snarky or thoughtful remarks or comments
↪regarding your choices.','Guess the number of mints in my hand.','Betty or
↪Veronica?','"That dress* that went viral a few years back - when I first saw
↪it, it was _____"','What is your favourite font?','Please estimate the
↪degree(s) of separation you have from the following celebrities [JK
↪Rowling]','Please estimate the degree(s) of separation you have from the
↪following celebrities [JJ Abrams]','Please estimate the degree(s) of
↪separation you have from the following celebrities [Beyoncé]','Please
↪estimate the degree(s) of separation you have from the following celebrities
↪[Bieber]','Please estimate the degree(s) of separation you have from the
↪following celebrities [Kevin Bacon]','Please estimate the degree(s) of
↪separation you have from the following celebrities [Francis Bacon (1561 -
↪1626)]','Which day do you prefer, Friday or Sunday?','Do you eat apples the
↪correct way, East to West (side to side) or do you eat them like a freak of
↪nature, South to North (bottom to top)?','When you see the above image of
↪the 4 different websites, which one would you most likely check out (please
↪be honest).',' [York Peppermint Patties] Ignore']
df_drop = df_lower.drop(columns=columns_to_drop)
```

[44]: ```
head new DF

df_drop.head()
```

[44]:
```
                 Timestamp  \
0 2016-10-24 05:09:23.033
1 2016-10-24 05:09:54.798
2 2016-10-24 05:13:06.734
3 2016-10-24 05:14:17.192
4 2016-10-24 05:14:24.625


  Are you going actually going trick or treating yourself? Your gender:  \
0                                                       no           male
1                                                       no           male
2                                                       no         female
3                                                       no           male
4                                                      yes           male


  How old are you? Which country do you live in?  \
0              22                          canada
1              45                             usa
2              48                              us
3              57                             usa
4              42                             usa
```

```
   Which state, province, county do you live in?  [100 Grand Bar]  \
0                                         ontario             joy
1                                              il             meh
2                                        colorado             joy
3                                              il             joy
4                                    south dakota             meh


   [Anonymous brown globs that come in black and orange wrappers]  \
0                                               despair
1                                                   meh
2                                               despair
3                                                   meh
4                                               despair


   [Any full-sized candy bar]  [Black Jacks]  …  [Three Musketeers]  \
0                          joy           meh  …                 joy
1                          joy           joy  …                 joy
2                          joy           meh  …                 joy
3                          joy           meh  …                 joy
4                          joy       despair  …                 joy


   [Tolberone something or other]  [Trail Mix]  [Twix]  \
0                              joy      despair     joy
1                              joy          meh     joy
2                              joy      despair     joy
3                              joy          joy     joy
4                              joy          meh     joy


   [Vials of pure high fructose corn syrup, for main-lining into your vein]  \
0                                               despair
1                                               despair
2                                               despair
3                                               despair
4                                                   joy


   [Vicodin]  [Whatchamacallit Bars]  [White Bread]  [Whole Wheat anything]  \
0       joy                  despair        despair                 despair
1       joy                      joy        despair                 despair
2   despair                      meh        despair                 despair
3       joy                      joy        despair                 despair
4       joy                      meh        despair                 despair


   [York Peppermint Patties]
0                        joy
1                        joy
2                        joy
3                        joy
```

```
4                               meh
```

[5 rows x 105 columns]

```python
[45]: # remove square brackets from column names

df_drop.columns = [col.replace('[', '').replace(']', '') for col in df_drop.
 ↪columns]
```

```python
[46]: # head new df

df_drop.head()
```

```
[46]:                  Timestamp  \
     0 2016-10-24 05:09:23.033
     1 2016-10-24 05:09:54.798
     2 2016-10-24 05:13:06.734
     3 2016-10-24 05:14:17.192
     4 2016-10-24 05:14:24.625

       Are you going actually going trick or treating yourself? Your gender:  \
     0                                                  no                 male
     1                                                  no                 male
     2                                                  no               female
     3                                                  no                 male
     4                                                 yes                 male

       How old are you? Which country do you live in?  \
     0               22                          canada
     1               45                             usa
     2               48                              us
     3               57                             usa
     4               42                             usa

       Which state, province, county do you live in?  100 Grand Bar  \
     0                                       ontario            joy
     1                                            il            meh
     2                                      colorado            joy
     3                                            il            joy
     4                                   south dakota            meh

        Anonymous brown globs that come in black and orange wrappers  \
     0                                               despair
     1                                                   meh
     2                                               despair
     3                                                   meh
     4                                               despair
```

```
     Any full-sized candy bar  Black Jacks  …  Three Musketeers  \
0                         joy            meh  …               joy
1                         joy            joy  …               joy
2                         joy            meh  …               joy
3                         joy            meh  …               joy
4                         joy        despair  …               joy

     Tolberone something or other  Trail Mix  Twix  \
0                              joy    despair   joy
1                              joy        meh   joy
2                              joy    despair   joy
3                              joy        joy   joy
4                              joy        meh   joy

     Vials of pure high fructose corn syrup, for main-lining into your vein  \
0                                                despair
1                                                despair
2                                                despair
3                                                despair
4                                                    joy

     Vicodin  Whatchamacallit Bars  White Bread  Whole Wheat anything  \
0        joy                despair      despair               despair
1        joy                    joy      despair               despair
2    despair                    meh      despair               despair
3        joy                    joy      despair               despair
4        joy                    meh      despair               despair

     York Peppermint Patties
0                        joy
1                        joy
2                        joy
3                        joy
4                        meh

[5 rows x 105 columns]
```

[ ]:

Chapter 8

```
[47]: # create hierarchical index

     df_drop.set_index(['Which country do you live in?', 'Your gender:', 'How old␣
      ↪are you?'], inplace=True)
```

```
[48]: # Head new df

      df_drop
```

```
[48]: Timestamp  \
      Which country do you live in? Your gender: How old are you?
      canada                        male        22.0             2016-10-24
      05:09:23.033
      usa                           male        45.0             2016-10-24
      05:09:54.798
      us                            female      48.0             2016-10-24
      05:13:06.734
      usa                           male        57.0             2016-10-24
      05:14:17.192
                                                42.0             2016-10-24
      05:14:24.625
      …
      …
                                    female      52.0             2016-10-29
      16:53:52.516
      united states                 male        33.0             2016-10-30
      06:53:54.735
      NaN                           male        NaN              2016-10-30
      11:06:10.827
      canada                        male        48.0             2016-10-30
      16:07:26.539
      us                            female      44.0             2016-10-30
      17:06:45.660

                                                             Are you going
      actually going trick or treating yourself?  \
      Which country do you live in? Your gender: How old are you?
      canada                        male        22.0
      no
      usa                           male        45.0
      no
      us                            female      48.0
      no
      usa                           male        57.0
      no
                                                42.0
      yes
      …
      …
                                    female      52.0
      no
      united states                 male        33.0
```

```
no
NaN                                 male        NaN
no
canada                              male        48.0
no
us                                  female      44.0
yes


                                                      Which state,
province, county do you live in?  \
Which country do you live in? Your gender: How old are you?
canada                              male        22.0
ontario
usa                                 male        45.0
il
us                                  female      48.0
colorado
usa                                 male        57.0
il
                                                42.0
south dakota
…
…
                                    female      52.0
tx
united states                       male        33.0
minnesota
NaN                                 male        NaN
<NA>
canada                              male        48.0
bc
us                                  female      44.0
nh


                                                     100 Grand Bar  \
Which country do you live in? Your gender: How old are you?
canada                              male        22.0                 joy
usa                                 male        45.0                 meh
us                                  female      48.0                 joy
usa                                 male        57.0                 joy
                                                42.0                 meh
…                                                                     …
                                    female      52.0                 joy
united states                       male        33.0                 joy
NaN                                 male        NaN                  joy
canada                              male        48.0                <NA>
us                                  female      44.0                 joy
```

	Anonymous brown globs that come in black and orange wrappers \		
Which country do you live in?	Your gender:	How old are you?	
canada	male	22.0	despair
usa	male	45.0	meh
us	female	48.0	despair
usa	male	57.0	meh
		42.0	despair
…			
…			
	female	52.0	despair
united states	male	33.0	despair
NaN	male	NaN	meh
canada	male	48.0	despair
us	female	44.0	meh

	Any full-sized candy bar \		
Which country do you live in?	Your gender:	How old are you?	
canada	male	22.0	joy
usa	male	45.0	joy
us	female	48.0	joy
usa	male	57.0	joy
		42.0	joy
…			
…			
	female	52.0	joy
united states	male	33.0	joy
NaN	male	NaN	

```
joy
canada                           male       48.0
joy
us                               female     44.0
joy

                                                           Black Jacks  \
Which country do you live in? Your gender: How old are you?
canada                           male       22.0                    meh
usa                              male       45.0                    joy
us                               female     48.0                    meh
usa                              male       57.0                    meh
                                            42.0                despair
…                                                                     …
                                 female     52.0                    meh
united states                    male       33.0                despair
NaN                              male       NaN                    <NA>
canada                           male       48.0                despair
us                               female     44.0                    joy

                                                   Bonkers (the candy)
\
Which country do you live in? Your gender: How old are you?
canada                           male       22.0                        meh
usa                              male       45.0                    despair
us                               female     48.0                        meh
usa                              male       57.0                        meh
                                            42.0                        meh
…                                                                         …
                                 female     52.0                        meh
united states                    male       33.0                        meh
NaN                              male       NaN                     despair
canada                           male       48.0                        meh
us                               female     44.0                        meh

                                               Bonkers (the board
game)  \
Which country do you live in? Your gender: How old are you?
canada                           male       22.0
meh
usa                              male       45.0
meh
us                               female     48.0
joy
usa                              male       57.0
despair
                                            42.0
```

```
joy
…
…
                               female       52.0
<NA>
united states                  male         33.0
despair
NaN                            male         NaN
despair
canada                         male         48.0
despair
us                             female       44.0
joy


                                                            Bottle Caps  …  \
Which country do you live in? Your gender: How old are you?              …
canada                         male         22.0                   meh  …
usa                            male         45.0                   joy  …
us                             female       48.0                   joy  …
usa                            male         57.0               despair  …
                                            42.0                   meh  …
…                                                              …    …
                               female       52.0                  <NA>  …
united states                  male         33.0                   meh  …
NaN                            male         NaN                    meh  …
canada                         male         48.0                   meh  …
us                             female       44.0                   joy  …


                                                       Three Musketeers  \
Which country do you live in? Your gender: How old are you?
canada                         male         22.0                    joy
usa                            male         45.0                    joy
us                             female       48.0                    joy
usa                            male         57.0                    joy
                                            42.0                    joy
…                                                                 …
                               female       52.0                    meh
united states                  male         33.0                    joy
NaN                            male         NaN                     meh
canada                         male         48.0                    meh
us                             female       44.0                    joy


                                                     Tolberone something
or other  \
Which country do you live in? Your gender: How old are you?
canada                         male         22.0
joy
```

```
usa                                 male      45.0
joy
us                                  female    48.0
joy
usa                                 male      57.0
joy
                                              42.0
joy
…
…
                                    female    52.0
joy
united states                       male      33.0
joy
NaN                                 male      NaN
joy
canada                              male      48.0
joy
us                                  female    44.0
joy


                                                        Trail Mix  Twix  \
Which country do you live in? Your gender: How old are you?
canada                              male      22.0      despair    joy
usa                                 male      45.0          meh    joy
us                                  female    48.0      despair    joy
usa                                 male      57.0          joy    joy
                                              42.0          meh    joy
…                                                           …    …
                                    female    52.0      despair    joy
united states                       male      33.0          meh    joy
NaN                                 male      NaN          meh    joy
canada                              male      48.0      despair    joy
us                                  female    44.0          meh    joy


                                                        Vials of pure high
fructose corn syrup, for main-lining into your vein  \
Which country do you live in? Your gender: How old are you?
canada                              male      22.0
despair
usa                                 male      45.0
despair
us                                  female    48.0
despair
usa                                 male      57.0
despair
                                              42.0
```

```
joy
…
…
                                female       52.0
despair
united states              male         33.0
joy
NaN                        male         NaN
despair
canada                     male         48.0
meh
us                         female       44.0
meh


                                                            Vicodin  \
Which country do you live in? Your gender: How old are you?
canada                     male         22.0              joy
usa                        male         45.0              joy
us                         female       48.0          despair
usa                        male         57.0              joy
                                        42.0              joy
…                                                           …
                                female       52.0          despair
united states              male         33.0              joy
NaN                        male         NaN           despair
canada                     male         48.0              joy
us                         female       44.0              meh


                                                      Whatchamacallit
Bars  \
Which country do you live in? Your gender: How old are you?
canada                     male         22.0
despair
usa                        male         45.0
joy
us                         female       48.0
meh
usa                        male         57.0
joy
                                        42.0
meh
…
…
                                female       52.0
joy
united states              male         33.0
meh
```

```
NaN                         male          NaN
joy
canada                      male          48.0
joy
us                          female        44.0
joy


                                                          White Bread  \
Which country do you live in? Your gender: How old are you?
canada                      male          22.0              despair
usa                         male          45.0              despair
us                          female        48.0              despair
usa                         male          57.0              despair
                                          42.0              despair
…                                                               …
                            female        52.0              despair
united states               male          33.0              despair
NaN                         male          NaN               despair
canada                      male          48.0                  meh
us                          female        44.0                  meh


                                                          Whole Wheat
anything  \
Which country do you live in? Your gender: How old are you?
canada                      male          22.0
despair
usa                         male          45.0
despair
us                          female        48.0
despair
usa                         male          57.0
despair
                                          42.0
despair
…
…
                            female        52.0
despair
united states               male          33.0
despair
NaN                         male          NaN
despair
canada                      male          48.0
meh
us                          female        44.0
meh
```

```
                                                           York Peppermint
Patties
Which country do you live in? Your gender: How old are you?
canada                          male          22.0
joy
usa                             male          45.0
joy
us                              female        48.0
joy
usa                             male          57.0
joy
                                              42.0
meh
…
…
                                female        52.0
meh
united states                   male          33.0
meh
NaN                             male          NaN
meh
canada                          male          48.0
despair
us                              female        44.0
joy

[1259 rows x 102 columns]
```

[49]:
```python
# melt the df to convert it to long format

melted_df=pd.melt(df_lower, id_vars=['Timestamp','Are you going actually going␣
 ↪trick or treating yourself?', 'Your gender:', 'How old are you?',
                              'Which country do you live in?','Which state,␣
 ↪province, county do you live in?'],
                 var_name='Candy_Type', value_name='Preference')
```

[50]:
```python
# print the reshaped df

print(melted_df)
```

```
                   Timestamp  \
0        2016-10-24 05:09:23.033
1        2016-10-24 05:09:54.798
2        2016-10-24 05:13:06.734
3        2016-10-24 05:14:17.192
4        2016-10-24 05:14:24.625
…                           …
147298 2016-10-29 16:53:52.516
```

```
147299 2016-10-30 06:53:54.735
147300 2016-10-30 11:06:10.827
147301 2016-10-30 16:07:26.539
147302 2016-10-30 17:06:45.660

       Are you going actually going trick or treating yourself? Your gender:  \
0                                                        no           male
1                                                        no           male
2                                                        no         female
3                                                        no           male
4                                                       yes           male
…                                                        …              …
147298                                                   no         female
147299                                                   no           male
147300                                                   no           male
147301                                                   no           male
147302                                                  yes         female

       How old are you? Which country do you live in?  \
0                   22                          canada
1                   45                             usa
2                   48                              us
3                   57                             usa
4                   42                             usa
…                    …                               …
147298              52                             usa
147299              33                   united states
147300            <NA>                            <NA>
147301              48                          canada
147302              44                              us

       Which state, province, county do you live in?  \
0                                             ontario
1                                                  il
2                                            colorado
3                                                  il
4                                        south dakota
…                                                   …
147298                                             tx
147299                                      minnesota
147300                                           <NA>
147301                                             bc
147302                                             nh

                       Candy_Type Preference
0                 [100 Grand Bar]        joy
1                 [100 Grand Bar]        meh
2                 [100 Grand Bar]        joy
```

```
3                   [100 Grand Bar]        joy
4                   [100 Grand Bar]        meh
...                              ...        ...
147298   [York Peppermint Patties] Ignore  NaN
147299   [York Peppermint Patties] Ignore  NaN
147300   [York Peppermint Patties] Ignore  NaN
147301   [York Peppermint Patties] Ignore  NaN
147302   [York Peppermint Patties] Ignore  NaN

[147303 rows x 8 columns]
```

Chapter 10

```
[51]:  # map the candy types into 'Chocolate' and 'Non-Chocolate'

candy_category_mapping = {
    ' [100 Grand Bar]': 'Chocolate',
    ' [Anonymous brown globs that come in black and orange wrappers]':␣
 ↪'Non-Chocolate',
    ' [Any full-sized candy bar]': 'Chocolate',
    ' [Black Jacks]': 'Non-Chocolate',
    ' [Bonkers (the candy)]': 'Non-Chocolate',
    ' [Bonkers (the board game)]': 'Non-Chocolate',
    ' [Bottle Caps]': 'Non-Chocolate',
    ' [Box\'o\'Raisins]': 'Non-Chocolate',
    ' [Broken glow stick]': 'Non-Chocolate',
    ' [Butterfinger]': 'Chocolate',
    ' [Cadbury Creme Eggs]': 'Chocolate',
    ' [Candy Corn]': 'Non-Chocolate',
    ' [Candy that is clearly just the stuff given out for free at restaurants]':
 ↪ 'Non-Chocolate',
    ' [Caramellos]': 'Chocolate',
    ' [Cash, or other forms of legal tender]': 'Non-Chocolate',
    ' [Chardonnay]': 'Non-Chocolate',
    ' [Chick-o-Sticks (we don't know what that is)]': 'Non-Chocolate',
    ' [Chiclets]': 'Non-Chocolate',
    ' [Coffee Crisp]': 'Chocolate',
    ' [Creepy Religious comics/Chick Tracts]': 'Non-Chocolate',
    ' [Dental paraphernalia]': 'Non-Chocolate',
    ' [Dots]': 'Non-Chocolate',
    ' [Dove Bars]': 'Chocolate',
    ' [Fuzzy Peaches]': 'Non-Chocolate',
    ' [Generic Brand Acetaminophen]': 'Non-Chocolate',
    ' [Glow sticks]': 'Non-Chocolate',
    ' [Goo Goo Clusters]': 'Chocolate',
    ' [Good N\' Plenty]': 'Non-Chocolate',
    ' [Gum from baseball cards]': 'Non-Chocolate',
    ' [Gummy Bears straight up]': 'Non-Chocolate',
```

```python
    ' [Hard Candy]': 'Non-Chocolate',
    ' [Healthy Fruit]': 'Non-Chocolate',
    ' [Heath Bar]': 'Chocolate',
    ' [Hershey\'s Dark Chocolate]': 'Chocolate',
    ' [Hershey's Milk Chocolate]': 'Chocolate',
    ' [Hershey\'s Kisses]': 'Chocolate',
    ' [Hugs (actual physical hugs)]': 'Non-Chocolate',
    ' [Jolly Rancher (bad flavor)]': 'Non-Chocolate',
    ' [Jolly Ranchers (good flavor)]': 'Non-Chocolate',
    ' [JoyJoy (Mit Iodine!)]': 'Non-Chocolate',
    ' [Junior Mints]': 'Chocolate',
    ' [Senior Mints]': 'Chocolate',
    ' [Kale smoothie]': 'Non-Chocolate',
    ' [Kinder Happy Hippo]': 'Chocolate',
    ' [Kit Kat]': 'Chocolate',
    ' [LaffyTaffy]': 'Non-Chocolate',
    ' [LemonHeads]': 'Non-Chocolate',
    ' [Licorice (not black)]': 'Non-Chocolate',
    ' [Licorice (yes black)]': 'Non-Chocolate',
    ' [Lindt Truffle]': 'Chocolate',
    ' [Lollipops]': 'Non-Chocolate',
    ' [Mars]': 'Chocolate',
    ' [Mary Janes]': 'Non-Chocolate',
    ' [Maynards]': 'Non-Chocolate',
    ' [Mike and Ike]': 'Non-Chocolate',
    ' [Milk Duds]': 'Chocolate',
    ' [Milky Way]': 'Chocolate',
    ' [Regular M&Ms]': 'Chocolate',
    ' [Peanut M&M's]': 'Chocolate',
    ' [Blue M&M\'s]': 'Chocolate',
    ' [Red M&M\'s]': 'Chocolate',
    ' [Third Party M&M\'s]': 'Chocolate',
    ' [Minibags of chips]': 'Non-Chocolate',
    ' [Mint Kisses]': 'Chocolate',
    ' [Mint Juleps]': 'Non-Chocolate',
    ' [Mr. Goodbar]': 'Chocolate',
    ' [Necco Wafers]': 'Non-Chocolate',
    ' [Nerds]': 'Non-Chocolate',
    ' [Nestle Crunch]': 'Chocolate',
    ' [Now\'n\'Laters]': 'Non-Chocolate',
    ' [Peeps]': 'Non-Chocolate',
    ' [Pencils]': 'Non-Chocolate'
}

# create a new column 'Candy_Category' based on the candy_category_mapping
```

```
melted_df['Candy_Category'] = melted_df['Candy_Type'].
  ↪map(candy_category_mapping)
```

[52]:
```python
# group 'Candy_Category' and calculate the count for each group

grouped_df = melted_df.groupby(['Candy_Category', 'Preference']).size().
  ↪reset_index(name='Count')
```

[53]:
```python
# print the grouped df

print(grouped_df)
```

```
  Candy_Category Preference   Count
0      Chocolate    despair    5382
1      Chocolate        joy   17103
2      Chocolate        meh   10946
3  Non-Chocolate    despair   22037
4  Non-Chocolate        joy   11701
5  Non-Chocolate        meh   16908
```

[54]:
```python
# create a cross tab of 'Candy_Category' and 'Preference'

cross_tab = pd.crosstab(melted_df['Candy_Category'], melted_df['Preference'])
```

[55]:
```python
# print the cross tab

print(cross_tab)
```

```
Preference      despair     joy     meh
Candy_Category
Chocolate          5382   17103   10946
Non-Chocolate     22037   11701   16908
```

Chapter 11

[56]:
```python
# find and print data type

timestamp_dtype = melted_df['Timestamp'].dtypes

print(timestamp_dtype)
```

```
datetime64[ns]
```

[57]:
```python
# calc the date range

date_range = pd.date_range(start=melted_df['Timestamp'].min(),␣
  ↪end=melted_df['Timestamp'].max(), freq='D')
```

```
[58]: # print the date range

      print(date_range)
```

```
DatetimeIndex(['2016-10-24 05:09:23.033000', '2016-10-25 05:09:23.033000',
               '2016-10-26 05:09:23.033000', '2016-10-27 05:09:23.033000',
               '2016-10-28 05:09:23.033000', '2016-10-29 05:09:23.033000',
               '2016-10-30 05:09:23.033000'],
              dtype='datetime64[ns]', freq='D')
```

```
[59]: # convert 'Timestamp' to periods


      melted_df['Timestamp_Period'] = melted_df['Timestamp'].dt.to_period('d')
```

```
[60]: # head df

      melted_df.head()
```

```
[60]:                  Timestamp  \
      0 2016-10-24 05:09:23.033
      1 2016-10-24 05:09:54.798
      2 2016-10-24 05:13:06.734
      3 2016-10-24 05:14:17.192
      4 2016-10-24 05:14:24.625


        Are you going actually going trick or treating yourself? Your gender:  \
      0                                                no              male
      1                                                no              male
      2                                                no            female
      3                                                no              male
      4                                               yes              male


        How old are you? Which country do you live in?  \
      0              22                         canada
      1              45                            usa
      2              48                             us
      3              57                            usa
      4              42                            usa


        Which state, province, county do you live in?        Candy_Type Preference  \
      0                                ontario    [100 Grand Bar]        joy
      1                                     il    [100 Grand Bar]        meh
      2                               colorado    [100 Grand Bar]        joy
      3                                     il    [100 Grand Bar]        joy
      4                           south dakota    [100 Grand Bar]        meh


        Candy_Category Timestamp_Period
```

```
0       Chocolate         2016-10-24
1       Chocolate         2016-10-24
2       Chocolate         2016-10-24
3       Chocolate         2016-10-24
4       Chocolate         2016-10-24
```

[61]: ```python
convert 'Timestamp_Period' back to timestamps

melted_df['Timestamp_Back'] = melted_df['Timestamp_Period'].dt.to_timestamp()
```

[62]: ```python
# head df

melted_df.head()
```

[62]:
```
                  Timestamp  \
0 2016-10-24 05:09:23.033
1 2016-10-24 05:09:54.798
2 2016-10-24 05:13:06.734
3 2016-10-24 05:14:17.192
4 2016-10-24 05:14:24.625


  Are you going actually going trick or treating yourself? Your gender:  \
0                                                 no          male
1                                                 no          male
2                                                 no        female
3                                                 no          male
4                                                yes          male


  How old are you? Which country do you live in?  \
0              22                        canada
1              45                           usa
2              48                            us
3              57                           usa
4              42                           usa


  Which state, province, county do you live in?        Candy_Type Preference  \
0                                      ontario  [100 Grand Bar]         joy
1                                           il  [100 Grand Bar]         meh
2                                     colorado  [100 Grand Bar]         joy
3                                           il  [100 Grand Bar]         joy
4                                 south dakota  [100 Grand Bar]         meh


  Candy_Category Timestamp_Period Timestamp_Back
0      Chocolate       2016-10-24     2016-10-24
1      Chocolate       2016-10-24     2016-10-24
2      Chocolate       2016-10-24     2016-10-24
3      Chocolate       2016-10-24     2016-10-24
```

4   Chocolate   2016-10-24   2016-10-24

[ ]: