# Brian\_Reppeto540Week7\_8

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## DSC 540 Week 7&8 Data Wrangling with Python:

### Chapter 7

```
Author: Brian Reppeto 1/25/2024
[36]: # import libraries
      import pandas as pd
[37]: # read candy file
      candy_df=pd.read_excel("BOING-BOING-CANDY-HIERARCHY-2016-SURVEY-Responses.xlsx")
[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
                                                                           Male
      1
                                                         No
      2
                                                         No
                                                                         Female
      3
                                                         No
                                                                           Male
      4
                                                                           Male
                                                        Yes
        How old are you? Which country do you live in? ∖
      0
                      22
                                                 Canada
                      45
      1
                                                    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
                                                                JOY
                                               il
                                    South Dakota
                                                                MEH
   [Anonymous brown globs that come in black and orange wrappers]
0
                                               DESPAIR
1
                                                   MEH
                                               DESPAIR
2
3
                                                   MEH
4
                                               DESPAIR
                                [Black Jacks]
   [Any full-sized candy bar]
0
                           JOY
                                           MEH
                           JOY
1
                                           JOY
2
                           JOY
                                           MEH
3
                           JOY
                                          MEH ...
                                      DESPAIR ...
                           JOY
 Please estimate the degree(s) of separation you have from the following
celebrities [JK Rowling] \
                                           3 or higher
1
                                           3 or higher
2
                                           3 or higher
                                           3 or higher
3
                                           3 or higher
 Please estimate the degree(s) of separation you have from the following
celebrities [JJ Abrams]
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
                                           3 or higher
```

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

```
3 or higher
0
                                          3 or higher
1
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] \
                                          3 or higher
1
                                          3 or higher
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
  Please estimate the degree(s) of separation you have from the following
celebrities [Francis Bacon (1561 - 1626)]
                                          3 or higher
1
                                          3 or higher
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
  Which day do you prefer, Friday or Sunday?
0
                                       Friday
1
                                       Friday
2
                                       Sunday
                                       Sunday
3
                                       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)? \
                                       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
                  Science: Latest News and Headlines
1
                  Science: Latest News and Headlines
2
3
                  Science: Latest News and Headlines
4
                                                 ESPN
   [York Peppermint Patties] Ignore
```

NaN

0

```
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
                                                                            Male
      1
                                                                            Male
                                                          No
      2
                                                                          Female
                                                          No
      3
                                                                            Male
                                                          No
      4
                                                                            Male
                                                         Yes
        How old are you? Which country do you live in?
      0
                       22
                                                  Canada
      1
                       45
                                                     usa
      2
                       48
                                                      US
                       57
      3
                                                     usa
      4
                       42
                                                     USA
        Which state, province, county do you live in?
                                                         [100 Grand Bar]
      0
                                                Ontario
                                                                      JOY
                                                                      MEH
      1
                                                     il
                                               Colorado
      2
                                                                      JOY
      3
                                                     il
                                                                      JOY
      4
                                           South Dakota
                                                                      MEH
         [Anonymous brown globs that come in black and orange wrappers] \
      0
                                                     DESPAIR
      1
                                                         MEH
```

NaN

1

```
2
                                              DESPAIR
3
                                                  MEH
4
                                              DESPAIR
   [Any full-sized candy bar]
                                [Black Jacks]
0
                           JOY
                                          MEH
                           JOY
                                          JOY ...
1
2
                           JOY
                                          MEH ...
3
                           JOY
                                          MEH
4
                           JOY
                                      DESPAIR ...
  Please estimate the degree(s) of separation you have from the following
celebrities [JK Rowling] \
                                          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] \
                                                     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] \
                                          3 or higher
1
                                          3 or higher
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
  Please estimate the degree(s) of separation you have from the following
celebrities [Bieber] \
                                          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] \
                                          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)]
                                                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). \
                        Science: Latest News and Headlines
                        Science: Latest News and Headlines
      1
      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
                                       NaN
      [5 rows x 123 columns]
[41]: # 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
                                                                              male
                                                           no
      1
                                                                              male
                                                           no
      2
                                                                            female
                                                           no
      3
                                                                             male
                                                           no
                                                                             male
                                                          yes
        How old are you? Which country do you live in? ∖
      0
                       22
                                                   canada
      1
                       45
                                                      usa
      2
                       48
                                                       us
      3
                       57
                                                      usa
                       42
      4
                                                      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
                                                  meh
                                  joy
      1
                                  joy
                                                  joy
      2
                                  joy
                                                  meh
      3
                                                  meh
                                  joy
      4
                                  joy
                                             despair
```

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

```
celebrities [JK Rowling] \
                                          3 or higher
1
                                          3 or higher
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
 Please estimate the degree(s) of separation you have from the following
celebrities [JJ Abrams]
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]
                                          3 or higher
                                          3 or higher
1
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
                                          3 or higher
1
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
 Please estimate the degree(s) of separation you have from the following
celebrities [Kevin Bacon] \
                                          3 or higher
1
                                          3 or higher
2
                                          3 or higher
3
                                          3 or higher
                                          3 or higher
 Please estimate the degree(s) of separation you have from the following
celebrities [Francis Bacon (1561 - 1626)]
                                          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
                                             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)? \
                                             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).
                        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
                                       NaN
      1
                                       NaN
      3
                                       NaN
                                       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⊔
       othat 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⊔
        \hookrightarrowdegree(s) of separation you have from the following celebrities [JK_{\sqcup}
       →Rowling]', 'Please estimate the degree(s) of separation you have from the
       \hookrightarrowfollowing celebrities [JJ Abrams]', 'Please estimate the degree(s) of
       ⇔separation you have from the following celebrities [Beyoncé]', 'Please, I
       ⇔estimate the degree(s) of separation you have from the following celebrities ⊔
       _{\hookrightarrow}[Bieber]', 'Please estimate the degree(s) of separation you have from the _{\sqcup}
       \hookrightarrowfollowing celebrities [Kevin Bacon]','Please estimate the degree(s) of
        \hookrightarrowseparation you have from the following celebrities [Francis Bacon (1561 -_{\sqcup}
       _{\hookrightarrow}1626)]','Which day do you prefer, Friday or Sunday?','Do you eat apples the _{\sqcup}
       \hookrightarrowcorrect way, East to West (side to side) or do you eat them like a freak of \sqcup
       \hookrightarrownature, 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()
                        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
                                                                                male
      1
                                                             no
                                                                                male
      2
                                                                             female
                                                             no
      3
                                                                               male
                                                             no
                                                                               male
                                                            yes
        How old are you? Which country do you live in?
                        22
      0
                                                    canada
                        45
      1
      2
                        48
                                                        us
      3
                        57
                                                       บรล
                        42
                                                       บรล
```

[44]:

```
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
                                            meh
                            joy
                                                                      joy
1
                            joy
                                             joy
                                                                      joy
2
                            joy
                                             meh
                                                                      joy
3
                            joy
                                            meh
                                                                      joy
4
                                        despair
                            joy
                                                                      joy
   [Tolberone something or other]
                                      [Trail Mix]
                                                     [Twix]
0
                                          despair
                                 joy
                                                        joy
1
                                 joy
                                               meh
                                                        joy
2
                                          despair
                                 joy
                                                        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
                                                despair
                                                                          despair
         joy
                               despair
1
         joy
                                                despair
                                                                          despair
                                    joy
2
     despair
                                    meh
                                                despair
                                                                          despair
3
                                                despair
                                                                          despair
         joy
                                    joy
4
                                                despair
                                                                          despair
         joy
                                    meh
   [York Peppermint Patties]
0
                           joy
1
                           joy
2
                           joy
3
                           joy
```

4 meh [5 rows x 105 columns] [45]: # remove square brackets from column names df\_drop.columns = [col.replace('[', '').replace(']', '') for col in df\_drop. ⇔columns] [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 male no male 1 no 2 no female 3 male no 4 yes male How old are you? Which country do you live in? 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 \ despair 0 1 meh 2 despair 3 meh

despair

4

```
0
                               joy
                                             meh
                                                                   joy
      1
                               joy
                                             joy
                                                                   joy
      2
                               joy
                                             meh
                                                                   joy
      3
                                             meh
                               joy
                                                                   joy
      4
                               joy
                                         despair
                                                                   joy
         Tolberone something or other
                                         Trail Mix
                                                    Twix \
      0
                                           despair
                                    joy
                                                     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
                                                                     despair
      0
                                despair
                                              despair
             joy
      1
             joy
                                              despair
                                                                     despair
                                     joy
      2
         despair
                                    meh
                                              despair
                                                                     despair
                                              despair
                                                                     despair
      3
             joy
                                     joy
      4
                                    meh
                                              despair
                                                                     despair
             joy
         York Peppermint Patties
      0
                              joy
      1
                              joy
      2
                              joy
      3
                              joy
                              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)
```

Black Jacks

Any full-sized candy bar

Three Musketeers \

#### df\_drop [48]: Timestamp \ Which country do you live in? Your gender: How old are you? canada male22.0 2016-10-24 05:09:23.033 usa male 45.0 2016-10-24 05:09:54.798 female 48.0 2016-10-24 us 05:13:06.734 usa male57.0 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 33.0 united states male 2016-10-30 06:53:54.735 NaN 2016-10-30 male ${\tt NaN}$ 11:06:10.827 canada male 48.0 2016-10-30 16:07:26.539 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 male22.0 nο male 45.0 usa no female 48.0 us no male 57.0 usa no 42.0 yes female 52.0 no

[48]: # Head new df

united states

33.0

male

NaN	male	NaN		
no		40.0		
canada	male	48.0		
no us	female	44.0		
yes	Temale	11.0		
<i>y</i> 0.5				
			Which state,	
province, county do you live	in? \		,	
Which country do you live in?		How old are you?		
canada	male	22.0		
ontario				
usa	male	45.0		
il				
us	female	48.0		
colorado				
usa	male	57.0		
il		40.0		
.1. 1.1.		42.0		
south dakota				
	female	52.0		
tx	Temale	52.0		
united states	male	33.0		
minnesota	marc	00.0		
NaN	male	NaN		
<na></na>				
canada	male	48.0		
bc				
us	female	44.0		
nh				
			100 Grand Bar	\
Which country do you live in?	_			
canada	male	22.0	joy	
usa	male	45.0	meh	
us	female	48.0	joy	
usa	male	57.0	joy	
		42.0	meh	
	£ama1 -	FO 0		
	female	52.0	joy	
united states	male	33.0	joy	
NaN	male	NaN	joy	
canada	male female	48.0	<na></na>	
us	тешате	44.0	joy	

no

### Anonymous brown

			Anonymous brown
globs that come in black and			
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	maro	10.0	
_			
118	female	44.0	
us meh	female	44.0	
meh	female	44.0	
	female	44.0	Anv full-sized
meh	female	44.0	Any full-sized
meh candy bar \			Any full-sized
meh  candy bar \ Which country do you live in?	Your gender:	How old are you?	Any full-sized
meh  candy bar \ Which country do you live in? canada			Any full-sized
meh  candy bar \ Which country do you live in? canada joy	Your gender:	How old are you? 22.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa	Your gender:	How old are you?	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy	Your gender: male male	How old are you? 22.0 45.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us	Your gender:	How old are you? 22.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy	Your gender: male male female	How old are you? 22.0 45.0 48.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us	Your gender: male male	How old are you? 22.0 45.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy	Your gender: male male female	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
candy bar \ Which country do you live in? canada joy usa joy us joy us joy	Your gender: male male female	How old are you? 22.0 45.0 48.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy us joy us joy	Your gender: male male female	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
candy bar \ Which country do you live in? canada joy usa joy us joy us joy	Your gender: male male female	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy us joy us joy	Your gender: male male female male	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy usa joy	Your gender: male male female	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy usa joy joy joy joy joy	Your gender: male male female male	How old are you? 22.0 45.0 48.0 57.0 42.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy usa joy usa joy usa joy	Your gender: male male female male	How old are you? 22.0 45.0 48.0 57.0	Any full-sized
meh  candy bar \ Which country do you live in? canada joy usa joy us joy us joy usa joy joy joy joy joy	Your gender: male male female male	How old are you? 22.0 45.0 48.0 57.0 42.0	Any full-sized

joy			
canada	male	48.0	
joy us	female	44.0	
joy			
			,
Which country do you live in?	Your gender:	How old are you?	Black Jacks \
canada	male	22.0	meh
usa	male	45.0	joy
us	female	48.0	meh
usa	male	57.0 42.0	meh despair
<b></b>			
	female	52.0	meh
united states NaN	male male	33.0 NaN	despair <na></na>
canada	male	48.0	despair
us	female	44.0	joy
			Dl. (+l l.)
\			Bonkers (the candy)
Which country do you live in?	Your gender:	How old are you?	
canada	male	22.0	meh
usa us	male female	45.0 48.0	despair meh
usa	male	57.0	meh
		42.0	meh
<del></del>	female	52.0	 meh
united states	male	33.0	men
NaN	male	NaN	despair
canada	male	48.0	meh
us	female	44.0	meh
			Bonkers (the board
game) \			
Which country do you live in? canada	Your gender:	How old are you? 22.0	
meh	marc	22.0	
usa	male	45.0	
meh	female	18 N	
us joy	Temate	48.0	
usa	male	57.0	
despair		40.0	
		42.0	

joy			
	female	52.0	
<na></na>			
united states	male	33.0	
despair			
NaN	male	NaN	
despair	_		
canada	male	48.0	
despair	£ 1 .	44.0	
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></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?	_	-	<b>.</b>
canada	male male	22.0 45.0	joy
usa us	mare female	48.0	joy
usa	male	57.0	joy joy
usu	marc	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
or other \			Tolberone something
Which country do you live in?	Vour gender:	How old are you?	
canada	male	22.0	
joy	marc	<b>44.</b> V	
J = J			

joy				
us	female	48.0		
joy				
usa	male	57.0		
joy				
		42.0		
joy				
•••				
•••	female	52.0		
joy	Temare	32.0		
united states	male	33.0		
joy	maro	33.0		
NaN	male	NaN		
joy				
canada	male	48.0		
joy				
us	female	44.0		
joy				
			Trail Mix	Twix \
Which country do you live in?	_			
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		ion
united states	male	33.0	despair meh	joy
NaN	male	NaN	men	joy joy
canada	male	48.0	despair	joy
us	female	44.0	meh	joy
				J - J
			Vials of p	ure high
fructose corn syrup, for main	-lining into	your vein \	1	J
Which country do you live in?	_			
canada	male	22.0		
despair				
usa	male	45.0		
despair				
us	female	48.0		
despair				
usa	male	57.0		
despair		10.0		
		42.0		

45.0

male

usa

Temple	joy			
Separa				
despair   united states	•••	c 3	FO. 0	
united states         male         33.0	dognoir	iemale	52.0	
Joy NaN	_	malo	33 0	
NaN         male         NaN           despair         male         48.0           canada         male         48.0           meh         Us         female         44.0           Which country do you live in? Your gender:         How old are you?         joy           usa         male         22.0         joy           usa         female         48.0         despair           usa         female         57.0         joy           usa         male         33.0         joy           NaN         male         33.0         joy           NaN         male         48.0         despair           usa         female         44.0         meh           Bars \         female         48.0         joy           which country do you live in? Your gender:         How old are you?         rowspan="2">Rowspan=		mare	33.0	
despair   canada		male	NaN	
canada         male         48.0           meh         temale         44.0           us         female         44.0           meh         Vicodin \				
us         female         44.0           meh         Vicodin \           Which country do you live in?         Your gender:         How old are you?         joy           canada         male         22.0         joy           usa         male         45.0         joy           usa         female         57.0         joy           usa         male         57.0         joy           usa         female         52.0         despair           united states         male         33.0         joy           NaN         male         48.0         joy           us         female         48.0         joy           us         male         44.0         meh           Which country do you live in?         Your gender:         How old are you?         Canada           despair         gespair         gespair         gespair           usa         male         45.0         gespair           usa         female         45.0         gespair           usa         female         45.0         gespair           usa         female         45.0         gespair           usa         gespair	_	male	48.0	
meh           Which country do you live in?         Your gender:         How old are you?         joy           canada         male         22.0         joy           usa         male         45.0         joy           us         female         48.0         despair           usa         male         57.0         joy                 female         52.0         despair           united states         male         33.0         joy           NaN         male         33.0         joy           NaN         male         48.0         joy           us         female         44.0         meh           bars \         Whatchamacallit           Bars \         Which country do you live in? Your gender: How old are you? canada         genale         45.0           despair         usa         female         48.0           joy         us         female         48.0           meh         42.0         Female           usa         female         48.0           meh         42.0         Female           usa         female <td< td=""><td>meh</td><td></td><td></td><td></td></td<>	meh			
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 despair usa male 57.0 joy male 42.0 joy male 42.0 joy male 42.0 joy male 48.0 despair united states male 33.0 joy despair united states male 33.0 joy male NaN despair canada male 48.0 joy meh 44.0 meh 45.0 joy male 45.0 joy meh 45.0 joy male 45.0 joy meh 45.0 joy male 48.0 joy meh 45.0 joy male 48.0 joy meh 48.0 male 48.0 joy meh 48.0 joy meh 48.0 male 45.0 joy meh 45.0 joy male 48.0 male 45.0 joy us female 48.0 male 57.0 joy us female 57.0 joy meh 57.0 joy male 57.0 joy male 57.0 joy munited states male 57.0 joy united states male 53.0	us	female	44.0	
Which country do you live in? Your gender: How old are you? canada male 22.0 joy usa male 45.0 joy usa female 48.0 despair usa male 57.0 joy had are you? canada male 57.0 joy had are you? canada male 33.0 joy had are you? canada male 88.0 joy male 88.0 male 94.0 meh male 22.0 despair united states male 48.0 joy meh male 88.0 joy male 89.0 joy male 92.0 despair usa male 45.0 joy us female 48.0 joy usa female 48.0 male 48.0 meh usa joy male 57.0 joy us female 52.0 joy us male 57.0 joy us male 57.0 joy male 57.0 mal	meh			
Which country do you live in? Your gender: How old are you? canada male 22.0 joy usa male 45.0 joy usa female 48.0 despair usa male 57.0 joy had are you? canada male 57.0 joy had are you? canada male 33.0 joy had are you? canada male 88.0 joy male 88.0 male 94.0 meh male 22.0 despair united states male 48.0 joy meh male 88.0 joy male 89.0 joy male 92.0 despair usa male 45.0 joy us female 48.0 joy usa female 48.0 male 48.0 meh usa joy male 57.0 joy us female 52.0 joy us male 57.0 joy us male 57.0 joy male 57.0 mal				
canada         male         22.0         joy           usa         male         45.0         joy           usa         female         48.0         despair           usa         male         57.0         joy           usa         female         52.0         despair           united states         male         33.0         joy           NaN         male         NaN         despair           canada         male         48.0         joy           which country do you live in? Your gender:         How old are you?         Kenada           despair         male         22.0         45.0           joy         male         45.0         45.0           meh         42.0         45.0         45.0           meh         42.0         45.0         45.0           meh         42.0         45.0				Vicodin \
usa         male         45.0         joy           usa         female         48.0         despair           usa         male         57.0         joy				÷
us         female         48.0         despair           usa         male         57.0         joy           42.0         joy                united states         male         52.0         despair           united states         male         NaN         despair           canada         male         48.0         joy           us         female         44.0         meh           bars \              canada         male         22.0            despair              usa         male         45.0            joy          48.0            usa         male         45.0            joy              usa         female         48.0            joy              usa         female         57.0            joy				
usa       male       57.0       joy         42.0       joy              united states       male       52.0       despair         united states       male       33.0       joy         NaN       despair         canada       male       48.0       joy         usa       male       22.0          despair       usa       male       45.0          joy       us       female       48.0          meh       usa       female       57.0          joy       42.0				
### ### ### ### ### ### ### ### ### ##				_
united states       male       33.0       joy         NaN       male       NaN       despair         canada       male       48.0       joy         us       female       44.0       meh         Bars \       Whatchamacallit         Bars \       Which country do you live in? Your gender: How old are you?       Whatchamacallit         canada       male       22.0         despair       male       45.0         joy       sample       48.0         meh       meh         usa       female       48.0         meh       42.0         meh       42.0         meh       57.0         joy       female       52.0         joy       male       33.0	•••			
NaNmaleNaNdespaircanadamale48.0joyusfemale44.0mehBars \ Which country do you live in? Your gender: How old are you? canadamale22.0despairmale45.0usamale45.0joymehusamale57.0joy42.0mehjoyfemale52.0joymale33.0		female	52.0	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       male       45.0         joy       us       female       48.0         meh       male       57.0         joy       42.0         meh       42.0         meh       52.0         joy       male       52.0         joy       male       33.0	united states	male	33.0	joy
sus female 44.0 meh  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 meh meh meh joy meh mile 52.0 joy united states male 33.0	NaN	male	NaN	despair
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  meh female 52.0 joy united states male 33.0	canada			
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  meh female 52.0 joy united states male 33.0	us	female	44.0	meh
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  meh female 52.0 joy united states male 33.0				
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  meh   female 52.0  joy  united states male 33.0	Pama \			wnatchamacallit
canada       male       22.0         despair       male       45.0         joy       semale       48.0         meh       semale       57.0         joy       42.0         meh       semale       52.0         joy       semale       52.0         joy       semale       33.0		Vour gender:	How old are you?	
despair         usa       male       45.0         joy        female       48.0         meh        57.0         joy       42.0         meh           female       52.0         joy       united states       male       33.0				
usa       male       45.0         joy       female       48.0         meh          usa       male       57.0         joy       42.0         meh           female       52.0         joy       united states       male       33.0		maro	22.0	
us       female       48.0         meh       57.0         joy       42.0         meh           female       52.0         joy       male       33.0	_	male	45.0	
meh usa	joy			
usa       male       57.0         joy       42.0         meh           female       52.0         joy       male       33.0	us	female	48.0	
joy 42.0 meh female 52.0 joy united states male 33.0	meh			
#2.0 meh female 52.0 joy united states male 33.0		male	57.0	
meh female 52.0 joy united states male 33.0	joy			
female 52.0  joy united states male 33.0			40.0	
ments of the male	mah		42.0	
female 52.0 joy united states male 33.0			42.0	
joy united states male 33.0			42.0	
united states male 33.0		female		
		female		
	  joy		52.0	

NaN joy	male	NaN		
canada joy	male	48.0		
us joy	female	44.0		
			White Bread	\
Which country do you live in?			, .	
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		
united atotag	male	33.0	despair	
united states NaN	male male	NaN	despair	
nan canada	male	48.0	despair meh	
	female	44.0	meh	
us	Temale	44.0	men	
			Whole Wheat	
anything \			whole wheat	
Which country do you live in?	Your gender:	How old are you?		
canada	male	22.0		
despair	maro	22.0		
usa	male	45.0		
despair	maro	10.0		
us	female	48.0		
despair		2010		
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

```
Which country do you live in? Your gender: How old are you?
                                    male
                                                  22.0
      canada
      joy
                                    male
                                                  45.0
      usa
      joy
                                    female
     us
                                                  48.0
      joy
                                    male
                                                  57.0
      usa
      joy
                                                  42.0
     meh
                                     female
                                                  52.0
     meh
     united states
                                    male
                                                  33.0
     meh
     NaN
                                    male
                                                  NaN
     meh
      canada
                                    male
                                                  48.0
      despair
                                    female
                                                  44.0
     us
      joy
      [1259 rows x 102 columns]
[49]: # 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]: # 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
```

Patties

```
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
2
                                                                          female
                                                          no
3
                                                                            male
                                                          no
4
                                                                            male
                                                         yes
147298
                                                                          female
                                                          no
147299
                                                                            male
                                                          no
                                                                            male
147300
                                                          no
147301
                                                                            male
                                                          no
147302
                                                                          female
                                                         yes
       How old are you? Which country do you live in?
0
                      22
                                                  canada
1
                      45
                                                     usa
                      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
                                                     il
3
4
                                          south dakota
147298
                                                     tx
147299
                                             minnesota
147300
                                                   <NA>
147301
                                                     bc
147302
                                                     nh
                                 Candy_Type Preference
                           [100 Grand Bar]
0
                                                    joy
1
                           [100 Grand Bar]
                                                    meh
2
                           [100 Grand Bar]
                                                    joy
```

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

```
[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]: # group 'Candy Category' and calculate the count for each group
      grouped_df = melted_df.groupby(['Candy_Category', 'Preference']).size().
       ⇔reset index(name='Count')
[53]: # print the grouped df
      print(grouped_df)
       Candy_Category Preference Count
            Chocolate
                         despair
                                   5382
     0
            Chocolate
                             joy 17103
     1
            Chocolate
                             meh 10946
     3 Non-Chocolate
                         despair 22037
     4 Non-Chocolate
                             joy 11701
     5 Non-Chocolate
                             meh 16908
[54]: # create a cross tab of 'Candy_Category' and 'Preference'
      cross_tab = pd.crosstab(melted_df['Candy_Category'], melted_df['Preference'])
[55]: # 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]: # find and print data type
      timestamp_dtype = melted_df['Timestamp'].dtypes
      print(timestamp_dtype)
     datetime64[ns]
[57]: # 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
                                                                           male
                                                          no
      1
                                                                            male
                                                          no
      2
                                                                          female
                                                          no
      3
                                                                           male
                                                          no
      4
                                                         yes
                                                                           male
        How old are you? Which country do you live in?
      0
                      22
                                                  canada
      1
                      45
                                                     บรล
      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
                                                          [100 Grand Bar]
      1
                                                     il
                                                                                  meh
      2
                                              colorado
                                                          [100 Grand Bar]
                                                                                  joy
      3
                                                          [100 Grand Bar]
                                                     il
                                                                                  joy
      4
                                                          [100 Grand Bar]
                                          south dakota
                                                                                  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]: # convert 'Timestamp_Period' back to timestamps
      melted_df['Timestamp_Back'] = melted_df['Timestamp_Period'].dt.to_timestamp()
[62]: # 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
                                                                            male
                                                          no
      1
                                                          no
                                                                            male
      2
                                                                          female
                                                          no
      3
                                                                            male
                                                          no
      4
                                                                            male
                                                         yes
        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
                                                           [100 Grand Bar]
      1
                                                     il
                                                                                  meh
      2
                                               colorado
                                                           [100 Grand Bar]
                                                                                   joy
      3
                                                           [100 Grand Bar]
                                                     il
                                                                                   joy
      4
                                                           [100 Grand Bar]
                                           south dakota
                                                                                   meh
        Candy_Category Timestamp_Period Timestamp_Back
      0
             Chocolate
                              2016-10-24
                                              2016-10-24
             Chocolate
                              2016-10-24
                                              2016-10-24
      1
             Chocolate
      2
                              2016-10-24
                                              2016-10-24
      3
             Chocolate
                              2016-10-24
                                              2016-10-24
```

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

[]: