# Global Recipe Sentiment Analysis

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```
[1]: import pandas as pd
import matplotlib.pyplot as plt
import nltk
from nltk.probability import FreqDist
import numpy as np
import csv
from collections import Counter
```

# 1 Pre-processing steps

```
[2]: file = open("whole_data_final.txt", 'r', encoding='utf-8').read()
[3]: def prepoccessingData2(data_file):
      newspapers = data_file.
     newspapers = newspapers[1:-1]
      column_name = ['Full text', 'Subject', 'Title', 'Publication title', __
     → 'Publication year', 'Place of publication']
      newspaper_df = pd.DataFrame(columns=column_name)
      newspaper = []
      for i in range(0, len(newspapers)):
        newspapers[i] = newspapers[i].split('\n\n')
        newspaper_list = ["","","","","",""]
        for datum in newspapers[i]:
          if ':' in datum:
            datum = datum.split(': ')
            if datum[0] in column_name:
              if datum[0] == 'Full text':
                datum[1] = datum[1].replace("\xa0 ", "")
                punc = '''!()-[]{};:'"'°'\\,<>./?@#$%^&*_~'''
                for character in datum[1]:
                      if character in punc:
                          datum[1] = datum[1].replace(character, "")
                newspaper_list[0] = datum[1]
```

```
if datum[0] == 'Subject':
                 newspaper_list[1] = datum[1]
               if datum[0] == 'Title':
                 newspaper_list[2] = datum[1]
               if datum[0] == 'Publication title':
                 newspaper_list[3] = datum[1]
               if datum[0] == 'Publication year':
                 newspaper_list[4] = datum[1]
               if datum[0] == 'Place of publication':
                 newspaper_list[5] = datum[1]
         newspaper.append(newspaper_list)
       newspaper_df = pd.DataFrame(newspaper, columns=column_name)
       return newspaper_df
[4]: df = prepoccessingData2(file)
    1.0.1 Fixing some errors: Full Article
[5]: article = []
     for art in file.
      ⇔split("______
         article.append(art)
[6]: article = article[1:-1]
     len(article) # confirm that length of the article matches with the length of
      \rightarrow newspaper_df
[6]: 6580
[7]: recipe = []
     start = "Full text:"
     end1 = "Subject:"
     end2 = "Title:"
     for art in article:
         if end1 in art:
             sub = art[art.find(start)+11:art.find(end1)] # sometimes article ends_
      ⇒before "Subject:"
         else:
             sub = art[art.find(start)+11:art.find(end2)] # sometimes article ends_
      →before "Title:"
         recipe.append(sub)
[8]: new_df = pd.DataFrame({"Full text":recipe})
```

[9]: df["Full text"] = new\_df

#### 1.0.2 Fixing some errors: Publication Year

```
[10]: def count_spaces(some_string):
        return some_string.count(" ")
[11]: space_series = df['Publication year'].apply(count_spaces)
[12]: space_series.value_counts()
[12]: Publication year
      0
           6577
      1
      Name: count, dtype: int64
[13]: space_series[space_series == 1]
[13]: 638
              1
      2617
              1
      2827
      Name: Publication year, dtype: int64
[14]: df.iloc[space_series[space_series == 1].index]['Publication year']
[14]: 638
              20 18
      2617
              20 07
              20 05
      2827
      Name: Publication year, dtype: object
[15]: df.loc[df['Publication year'] == "20 18", 'Publication year'] = "2018"
      df.loc[df['Publication year'] == "20 07", 'Publication year'] = "2007"
      df.loc[df['Publication year'] == "20 05", 'Publication year'] = "2005"
[16]: space_series_2 = df['Publication year'].apply(count_spaces)
      space_series_2[space_series_2 == 1]
[16]: Series([], Name: Publication year, dtype: int64)
[17]: df["Publication year"] = pd.to_numeric(df["Publication year"])
      df = df.sort_values(by=['Publication year']).reset_index(drop=True)
      df = df.replace("", np.nan)
      df.dropna(inplace=True, subset=["Full text","Publication year"])
     1.0.3 Preprocessing: deleting some letters that are not related to the recipes
[18]: regular_punct = ["\n", "Enlarge this image", "", "This article originally appeared_
       →in The New York Times..."]
      def remove_unnecessary(text,punct_list):
```

```
for punc in punct_list:
    if punc in text:
        text = text.replace(punc, ' ')
    return text.strip()

df['Full text'] = df['Full text'].apply(lambda x:
    →remove_unnecessary(x,regular_punct))
```

# 2 Our dictionary of country names and their demonyms:

```
[19]: # open file in read mode
      country_dict = {}
      convert_country ={}
      with open("countries.csv", 'r') as f:
           for line in csv.reader(f):
                  country_dict[line[0]] = line[1:]
                  convert_country[line[0]] = line[1]
[20]: continents = {}
      with open("continents.csv", 'r') as c:
           for line in csv.reader(c):
                  continents[line[0]] = line[1]
[21]: empty = ''
      for value in country_dict.values():
          if empty in value:
              value.remove(empty)
[22]: df.insert(1, "Country", "")
      df.insert(2,"Continent","")
      # Get country names mentioned in each article
      for index, row in df.iterrows():
          for word in row["Full text"].split():
              for key, value in country_dict.items():
                  if word in value:
                      df.loc[index, 'Country'] += key + " "
[23]: # Get the most frequently mentioned country
      for index, row in df.iterrows():
          lst = Counter(row["Country"].split()).most_common(1)
          name = ""
          if lst:
              most, number = 1st[0]
              name = convert_country[most]
          df.loc[index, "Country"] = name
```

```
[24]: # Get the continent name for most frequently mentioned country
for index, row in df.iterrows():
    name = row["Country"]
    continent = continents[name] if name else ""
    df.at[index, "Continent"] = continent
2.1 Divide into 4 eras
[25]: era1 = df.loc[(df["Publication year"]>= 1980) & (df["Publication year"] < 1990)]

[25]: era2 = df.loc[(df["Publication year"]>= 1980) & (df["Publication year"] < 1990)]</pre>
```

```
era2 = df.loc[(df["Publication year"]>= 1990) & (df["Publication year"] < 2000)]
era3 = df.loc[(df["Publication year"]>= 2000) & (df["Publication year"] < 2010)]
era4 = df[df["Publication year"]>=2010]
[26]: # era1.to_csv("era1.csv")
# era2.to_csv("era2.csv")
# era2.to_csv("era2.csv")
```

```
# era2.to_csv("era2.csv")
# era3.to_csv("era3.csv")
# era4.to_csv("era4.csv")
```

#### 3 Era 1: 1980 - 1989

```
[27]: df_1 = pd.read_csv('./era1.csv')
df_1 = df_1.drop("Unnamed: 0",axis=1)
df_1 = df_1.replace(np.nan,"")
```

```
[28]: df_1
```

```
[28]:
                                                    Full text Country Continent \
      0
           Perhaps we find portents in curious places but...
           OFTEN, in the 23 years since I first joined Th... Greece
                                                                         Europe
      1
           Q. I recently created a key lime pie from one ...
      2
                                                                         Europe
                                                                Spain
      3
           For SportsMonday By NELSON BRYANT ASHORT while... Canada
                                                                       Americas
      4
           NOT long ago I had planned to serve four fairl...
      1560 LEAD: PLAYING culinary ''Beat the Clock'' has ...
      1561 LEAD: THE local strawberry season has started...
                                                               Italv
                                                                        Europe
      1562 LEAD: DON'T think that because tomorrow is New... France
                                                                         Europe
      1563 LEAD: ONE of the treasures of the kitchen is a... France
                                                                         Europe
      1564 LEAD: DON'T think that because tomorrow is New... France
                                                                         Europe
                                        Subject \
      0
      1
```

```
1
2
3
4
...
1560 COOKING AND COOKBOOKS; RECIPES
```

```
1561
     STRAWBERRIES; COOKING AND COOKBOOKS
1562
                 FOOD; RECIPES; CHRISTMAS
1563
           COOKING AND COOKBOOKS; RECIPES
1564
                 FOOD; CHRISTMAS; RECIPES
                                                   Title \
0
                                  FOOD THE FISH OF POETS
1
      EVOLUTION OF A RECIPE: VARIATIONS ON A VENERABL...
2
                                   QUESTIONS AND ANSWERS
3
             OUTDOORS: BAYBERRIES ARE ALWAYS A GOOD PICK
4
                                       60-MINUTE GOURMET
1560
       FOOD; A Meal That Takes Imagination, Not All Day
1561
      FOOD; Strawberries Are Here and It's Time for ...
1562
                    FOOD; Christmas Just Keeps On Going
1563
              FOOD; Whipping Up Canapes on Short Notice
1564
                    FOOD; Christmas Just Keeps On Going
                                       Publication title Publication year
0
      New York Times, Late Edition (East Coast); New...
                                                                     1980.0
      New York Times, Late Edition (East Coast); New...
1
                                                                     1980.0
2
      New York Times, Late Edition (East Coast); New...
                                                                     1980.0
3
      New York Times, Late Edition (East Coast); New...
                                                                     1980.0
     New York Times, Late Edition (East Coast); New...
                                                                     1980.0
                                                                        . . .
1560 New York Times, Late Edition (East Coast); New...
                                                                     1989.0
1561 New York Times, Late Edition (East Coast); New...
                                                                     1989.0
1562 New York Times, Late Edition (East Coast); New...
                                                                     1989.0
1563 New York Times, Late Edition (East Coast); New...
                                                                     1989.0
1564 New York Times, Late Edition (East Coast); New...
                                                                     1989.0
     Place of publication
0
           New York, N.Y.
1
           New York, N.Y.
2
           New York, N.Y.
3
           New York, N.Y.
4
           New York, N.Y.
1560
           New York, N.Y.
           New York, N.Y.
1561
           New York, N.Y.
1562
1563
           New York, N.Y.
1564
           New York, N.Y.
```

[1565 rows x 8 columns]

```
[29]: full_country_1 = []
full_continent_1 = []
for idx, row in df_1.iterrows():
    name = row["Country"]
    cont = row["Continent"]
    if name != 'United States of America' and name != "":
        full_country_1.append(name)
    if cont != "":
        full_continent_1.append(cont)
```

#### 3.0.1 Amount of times a country is mentioned (excluding US)

[31]: 69.58466453674122

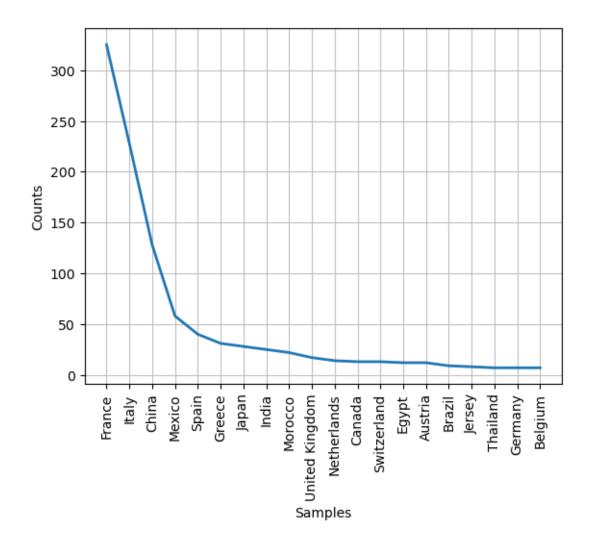
#### 3.0.2 20 most common countries mentioned

```
[32]: entity_string_freq_1 = nltk.FreqDist(full_country_1)
    print(entity_string_freq_1.most_common(20))
    FreqDist(entity_string_freq_1).plot(20)

[('France', 325), ('Italy', 228), ('China', 128), ('Mexico', 58), ('Spain', 40),
    ('Greece', 31), ('Japan', 28), ('India', 25), ('Morocco', 22), ('United)
```

Kingdom', 17), ('Netherlands', 14), ('Canada', 13), ('Switzerland', 13),
('Egypt', 12), ('Austria', 12), ('Brazil', 9), ('Jersey', 8), ('Thailand', 7),
('Germany', 7), ('Belgium', 7)]

[32]: <Axes: xlabel='Samples', ylabel='Counts'>

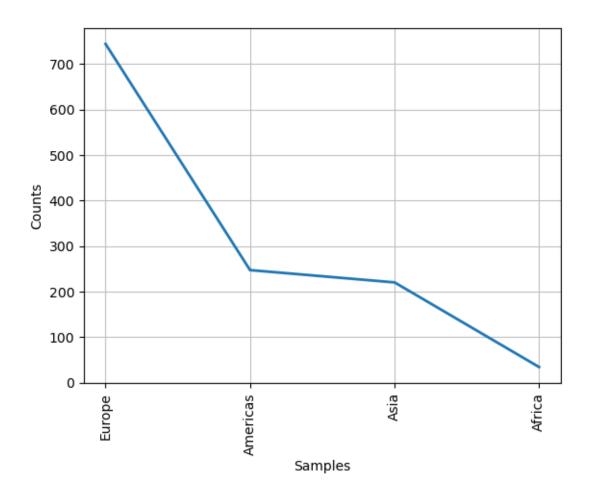


# 3.0.3 Plot the frequency continents

```
[33]: con_string_freq_1 = nltk.FreqDist(full_continent_1)
print(con_string_freq_1.most_common())
FreqDist(con_string_freq_1).plot()
```

[('Europe', 744), ('Americas', 247), ('Asia', 220), ('Africa', 34)]

[33]: <Axes: xlabel='Samples', ylabel='Counts'>



### 3.1 Era 2: 1990 - 1999

```
[34]: df_2 = pd.read_csv('./era2.csv')
      df_2 = df_2.drop("Unnamed: 0",axis=1)
      df_2 = df_2.replace(np.nan,"")
[35]: df_2
[35]:
                                                    Full text \
      0
            LEAD: VIRGIL THOMSON used to say that when you...
      1
            LEAD: THE late Alfredo Viazzi had for years a ...
            LEAD: THE late Alfredo Viazzi had for years a ...
            LEAD: PVT. Danyn Dubois is in training at this...
            LEAD: MOST home cooks shy away from curry for \dots
      4
      1723 SCALLOPS have so many virtues -- they're tende...
      1724 Headnote Remembrance of foods past. DEAR DESCE...
      1725 IT'S a simple almond cake, leavened by egg whi...
```

```
CHESTNUTS are challenging. Unlike walnuts, pec...
      SOMETIMES recipes say more about a place and t...
1727
                        Country Continent
0
                         France
                                   Europe
1
                          Italy
                                   Europe
2
                          Italy
                                   Europe
3
      United States of America
                                 Americas
4
. . .
1723
1724
      United States of America
                                 Americas
1725
                         France
                                   Europe
1726
1727
                        Georgia
                                     Asia
                                                  Subject
0
                          COOKING AND COOKBOOKS; RECIPES
1
                          COOKING AND COOKBOOKS; RECIPES
2
                          COOKING AND COOKBOOKS; RECIPES
3
      COOKING AND COOKBOOKS; UNITED STATES ARMAMENT ...
4
                          COOKING AND COOKBOOKS; RECIPES
1723
               Food; Time capsules; Recipes; Millennium
1724
1725
                              Recipes; Cooking; Desserts
1726
1727
                                                    Title \
0
      FOOD; Having Company? You Can Still Serve a Roast
1
              FOOD; Autumn Game With a Touch of Tuscany
2
              FOOD; Autumn Game With a Touch of Tuscany
3
                    Learning to Feed A Battalion or Two
4
                                       60-MINUTE GOURMET
. . .
1723
                                   Scallops, Plus Crunch
1724
                                         Good and plenty
                   The Pastry Chef's Rich Little Secret
1725
1726
                    The Chestnut Comes Out of Its Shell
1727
     Recipes of the South That Speak for the People...
                                       Publication title Publication year
0
      New York Times, Late Edition (East Coast); New...
                                                                     1990.0
1
      New York Times, Late Edition (East Coast); New...
                                                                     1990.0
2
      New York Times, Late Edition (East Coast); New...
                                                                     1990.0
3
      New York Times, Late Edition (East Coast); New...
                                                                     1990.0
```

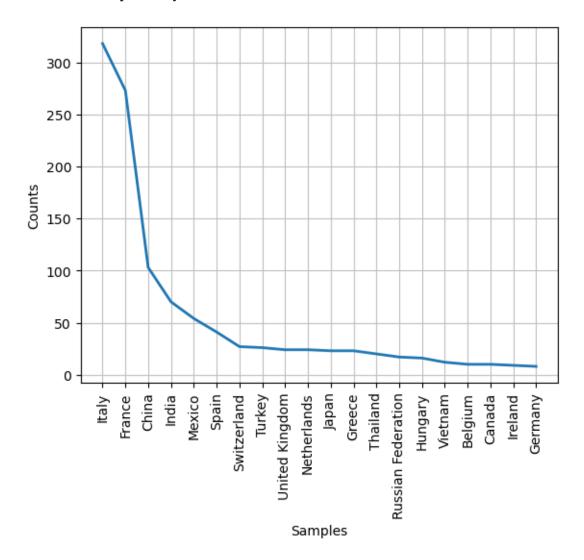
```
4
            New York Times, Late Edition (East Coast); New...
                                                                          1990.0
      . . .
                                                                             . . .
      1723 New York Times, Late Edition (East Coast); New...
                                                                          1999.0
                            New York Times Magazine; New York
      1724
                                                                          1999.0
      1725 New York Times, Late Edition (East Coast); New...
                                                                          1999.0
      1726 New York Times, Late Edition (East Coast); New...
                                                                          1999.0
      1727 New York Times, Late Edition (East Coast); New...
                                                                          1999.0
           Place of publication
                 New York, N.Y.
      0
                 New York, N.Y.
      1
      2
                 New York, N.Y.
      3
                 New York, N.Y.
      4
                 New York, N.Y.
      1723
                 New York, N.Y.
      1724
                       New York
      1725
                 New York, N.Y.
                 New York, N.Y.
      1726
      1727
                 New York, N.Y.
      [1728 rows x 8 columns]
[36]: full_country_2 = []
      full_continent_2 = []
      for idx, row in df_2.iterrows():
          name = row["Country"]
          cont = row["Continent"]
          if name != 'United States of America' and name != '':
              full_country_2.append(name)
          if cont != "":
              full_continent_2.append(cont)
     3.1.1 Amount of times a country is mentioned (excluding US)
[37]: len(full_country_2)
[37]: 1185
[38]: country_mention_2 = len(full_country_2)/len(list(df_2["Full text"])) * 100
      country_mention_2
[38]: 68.57638888888888
```

#### 3.1.2 20 most common countries mentioned

[39]: entity\_string\_freq\_2 = nltk.FreqDist(full\_country\_2)
 print(entity\_string\_freq\_2.most\_common(20))
 FreqDist(entity\_string\_freq\_2).plot(20)

[('Italy', 318), ('France', 273), ('China', 103), ('India', 70), ('Mexico', 54),
('Spain', 41), ('Switzerland', 27), ('Turkey', 26), ('United Kingdom', 24),
('Netherlands', 24), ('Japan', 23), ('Greece', 23), ('Thailand', 20), ('Russian
Federation', 17), ('Hungary', 16), ('Vietnam', 12), ('Belgium', 10), ('Canada', 10), ('Ireland', 9), ('Germany', 8)]

[39]: <Axes: xlabel='Samples', ylabel='Counts'>



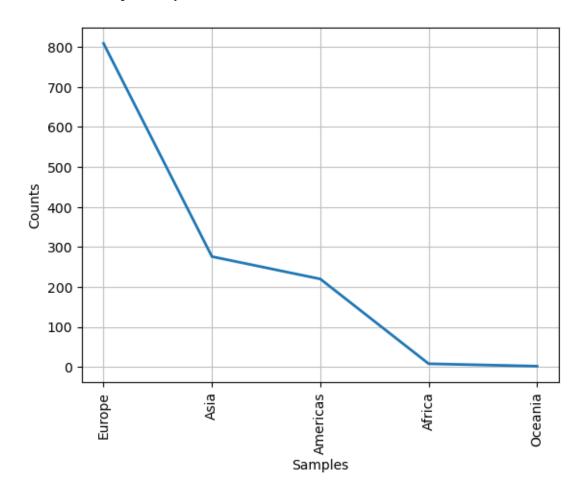
# 3.1.3 Plot the frequency by continents

```
[40]: con_string_freq_2 = nltk.FreqDist(full_continent_2)
print(con_string_freq_2.most_common())
FreqDist(con_string_freq_2).plot()

[('Europe', 809), ('Asia', 276), ('Americas', 220), ('Africa', 8), ('Oceania',
```

[40]: <Axes: xlabel='Samples', ylabel='Counts'>

2)]



## 3.2 Era 3: 2000 - 2009

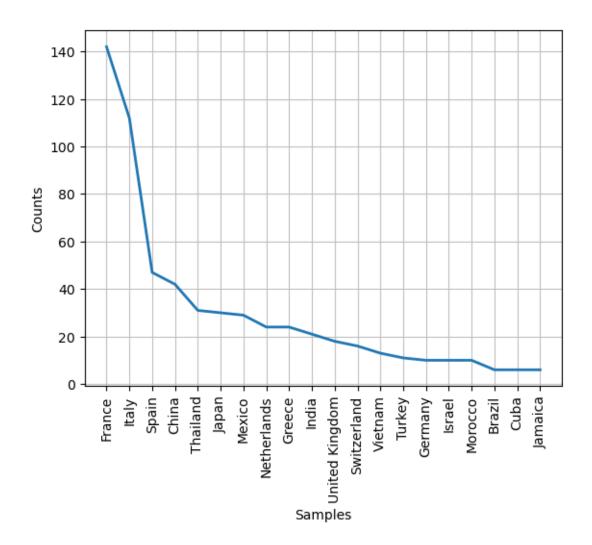
[42]: df\_3

```
[41]: df_3 = pd.read_csv('./era3.csv')
df_3 = df_3.drop("Unnamed: 0",axis=1)
df_3 = df_3.replace(np.nan,"")
```

```
[42]:
                                                     Full text \
      0
           Headnote A well-prepared meal might be the way...
      1
           THERE are two ways to give a dinner party and ...
      2
           Headnote A rare instance in which fat is your ...
           Headnote How I Learned to Stop Worrying... Hea...
      3
      4
           Headnote Who wants to he a millionaire? [veryo...
      993
          Want to make some extra dough on weekends? Piz...
          PAUL LIEBRANDT wants the world to know that he...
      994
      995
           MICHAEL RUHLMAN says his new book, "Ratio: The...
           WHEN you've gained enough experience cooking, ...
      996
           AS if a menu with lamb's tongue, calf's heart,...
      997
                            Country Continent \
      0
                               Spain
                                        Europe
      1
                               Italy
                                        Europe
      2
                        Netherlands
                                        Europe
      3
                              Brazil
                                      Americas
      4
           United States of America
                                      Americas
      993
                            Albania
                                        Europe
                     United Kingdom
      994
                                        Europe
      995
                             France
                                        Europe
      996
                               Italy
                                        Europe
      997
                     United Kingdom
                                        Europe
                                                Subject \
      0
                                 Cooking; Recipes; Food
      1
                                 Recipes; Meat; Cooking
      3
               Social life & customs; Cooking; Recipes
      4
                  Personal profiles; Cooking; Contests
      993
                                Pizza; Cooking; Recipes
      994
                                            Restaurants
      995
           Cooking; Recipes; Cookbooks; Books -- Ratio
      996
                   Vegetables; Recipes; Cooking; Soups
      997
                        Restaurants -- Feast-Houston TX
                                                         Title \
      0
                                        A taste for seduction
      1
           Give the Guests a Chef's Apron and Let the Coo...
      2
                                               Lvoe me tender
      3
           How I learned to stop worrying...and entertain...
      4
                                            Put up your mitts
      993
                                                   Crust Fund
```

```
994
                                             At Home, at Last
      995
                        Everyday Cooking Is as Easy as 3:2:1
      996
                         A Soup Only a Tuscan Could Think Up
                     British Derring-Do, Innards a Specialty
      997
                                            Publication title
                                                                Publication year
      0
                            New York Times Magazine; New York
                                                                          2000.0
           New York Times, Late Edition (East Coast); New...
      1
                                                                          2000.0
      2
                            New York Times Magazine; New York
                                                                          2000.0
      3
                            New York Times Magazine; New York
                                                                          2000.0
      4
                            New York Times Magazine; New York
                                                                          2000.0
      993
                            New York Times Magazine; New York
                                                                          2009.0
      994 New York Times, Late Edition (East Coast); New...
                                                                          2009.0
           New York Times, Late Edition (East Coast); New...
      995
                                                                          2009.0
      996 New York Times, Late Edition (East Coast); New...
                                                                          2009.0
          New York Times, Late Edition (East Coast); New...
                                                                          2009.0
          Place of publication
      0
                      New York
                New York, N.Y.
      1
      2
                      New York
      3
                      New York
      4
                      New York
      . .
      993
                      New York
                New York, N.Y.
      994
      995
                New York, N.Y.
      996
                New York, N.Y.
      997
                New York, N.Y.
      [998 rows x 8 columns]
[43]: full_country_3 = []
      full_continent_3 = []
      for idx, row in df_3.iterrows():
          name = row["Country"]
          cont = row["Continent"]
          if name != 'United States of America' and name != '':
              full_country_3.append(name)
          if cont != "":
              full_continent_3.append(cont)
```

## 3.2.1 Amount of times a country is mentioned (excluding US)

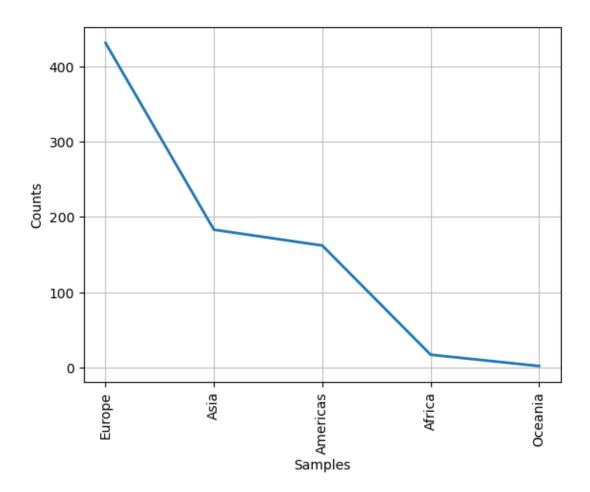


# 3.2.3 Plot the frequency by continents

```
[47]: con_string_freq_3 = nltk.FreqDist(full_continent_3)
    print(con_string_freq_3.most_common())
    FreqDist(con_string_freq_3).plot()

    [('Europe', 431), ('Asia', 183), ('Americas', 162), ('Africa', 17), ('Oceania', 2)]

[47]: <Axes: xlabel='Samples', ylabel='Counts'>
```



### 3.3 Era 4: 2010 - 2022

```
[48]: df_4 = pd.read_csv('./era4.csv')
      df_4 = df_4.drop("Unnamed: 0",axis=1)
      df_4 = df_4.replace(np.nan,"")
[49]: df_4
[49]:
                                                     Full text \
      0
            I'VE made several concessions at my table in t...
      1
            Most trends arise not from inspiration but fro...
      2
            Headnote What makes for a favorite dish? Just ...
            WHEN Julia Child introduced it to Americans ba...
      4
            Headnote Mastering Maialino's braise-worthy sa...
            This easy, make-ahead casserole makes creative...
      2264
      2265
            When I was in graduate school, nearly a decade...
      2266
            A coconut-milk dressing infused with garlic, g...
```

```
Buttery and soft, tart and sweet, these muffin...
2267
      Headnote Star Side: Creaminess, acidity and wa...
2268
                        Country Continent
0
                          Italy
                                   Europe
1
                         France
                                   Europe
2
      United States of America
                                Americas
3
                         Greece
                                   Europe
4
                   Netherlands
                                   Europe
                                      . . .
. . .
2264
                          Italy
                                   Europe
2265
                United Kingdom
                                   Europe
2266
2267
2268
      United States of America Americas
                                           Subject \
0
      Grain; Cooking; Restaurants; Recipes; Pasta
                    Recipes; Corn; Cooking; Taste
1
2
       Newspapers; Cooking; Recipes; Food; E mail
3
                      Recipes; Cooking; Vegetables
4
              Restaurants; Cooking; Recipes; Pork
2264
                                     Eggs; Recipes
2265
                         Baked goods; Recipes; Tea
2266
                                 Recipes; Tomatoes
                                 Recipes; Desserts
2267
2268
                          Cooking; Spices; Recipes
                                                    Title \
0
                                       Cardboard No More
1
                                            RECIPE REDUX
2
                                            RECIPE REDUX
3
      One Culture's Ratatouille Is Another's Fill-in...
4
                                                THE CHEAT
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                                      To Steep and Slice
      Here to Help; A Recipe for Coconut Fish and To...
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         Here to Help; A Recipe for Lemon Poppy Muffins
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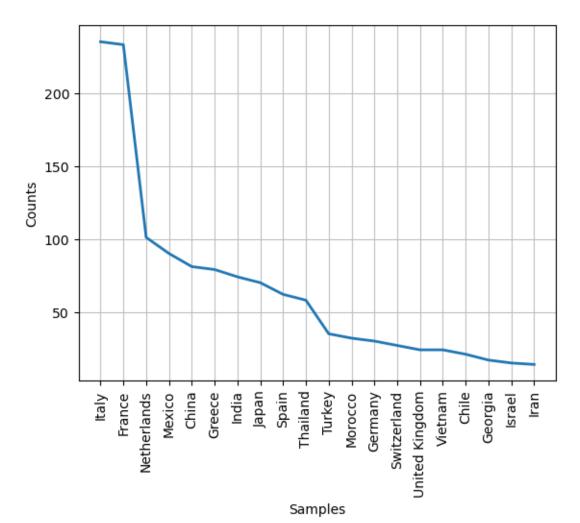
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      2268
                       New York
      [2269 rows x 8 columns]
[50]: full_country_4 = []
      full_continent_4 = []
      for idx, row in df_4.iterrows():
          name = row["Country"]
          cont = row["Continent"]
          if name != 'United States of America' and name != '':
              full_country_4.append(name)
          if cont != "":
              full_continent_4.append(cont)
     3.3.1 Amount of times a country is mentioned (excluding US)
[51]: len(full_country_4)
[51]: 1541
[52]: country_mention_4 = len(full_country_4)/len(list(df_4["Full text"])) * 100
      country_mention_4
[52]: 67.91538122520934
```

#### 3.3.2 20 most common countries mentioned

[53]: entity\_string\_freq\_4 = nltk.FreqDist(full\_country\_4)
print(entity\_string\_freq\_4.most\_common(20))
FreqDist(entity\_string\_freq\_4).plot(20)

[('Italy', 235), ('France', 233), ('Netherlands', 101), ('Mexico', 90),
('China', 81), ('Greece', 79), ('India', 74), ('Japan', 70), ('Spain', 62),
('Thailand', 58), ('Turkey', 35), ('Morocco', 32), ('Germany', 30),
('Switzerland', 27), ('United Kingdom', 24), ('Vietnam', 24), ('Chile', 21),
('Georgia', 17), ('Israel', 15), ('Iran', 14)]

[53]: <Axes: xlabel='Samples', ylabel='Counts'>

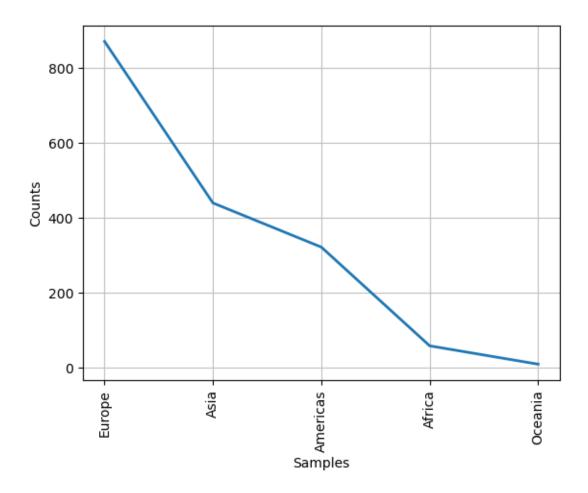


# 3.3.3 Plot the frequency by continents

```
[54]: con_string_freq_4 = nltk.FreqDist(full_continent_4)
    print(con_string_freq_4.most_common())
    FreqDist(con_string_freq_4).plot()

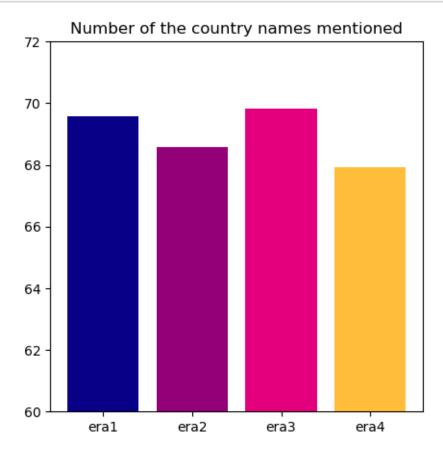
[('Europe', 872), ('Asia', 440), ('Americas', 322), ('Africa', 58), ('Oceania', 9)]
```

[54]: <Axes: xlabel='Samples', ylabel='Counts'>



### 3.4 Number of the country names mentioned per era

```
plt.bar(x, values,color=['#090088','#930077','#E4007C','#FFBD39'])
plt.xticks(x, years)
plt.ylim([60, 72])
plt.title("Number of the country names mentioned")
plt.show()
```



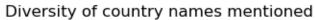
# 3.5 Diversity of country names mentioned per era

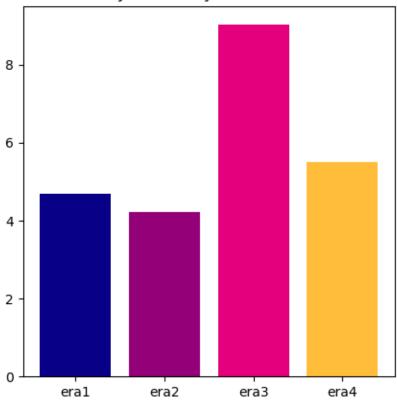
```
[56]: variation_1 = len(set(full_country_1))/len(full_country_1) * 100
variation_2 = len(set(full_country_2))/len(full_country_2) * 100
variation_3 = len(set(full_country_3))/len(full_country_3) * 100
variation_4 = len(set(full_country_4))/len(full_country_4) * 100
```

```
[57]: plt.rcParams["figure.figsize"] = (5,5)
x = np.arange(4)
years = ['era1', 'era2', 'era3','era4']
values = [variation_1, variation_2, variation_3, variation_4]

plt.bar(x, values, color=['#090088', '#930077', '#E4007C', '#FFBD39'])
```

```
plt.xticks(x, years)
plt.title("Diversity of country names mentioned")
plt.show()
```





# 4 LIWC sentiment analysis

# 4.1 Era 1: 1980 - 1989

```
[58]: df1_liwc = pd.read_csv('./era1_LIWC2015.csv')
      df1_liwc = df1_liwc.drop("Source (A)",axis=1)
      df1_liwc.insert(1,"Country","")
      df1_liwc.insert(2,"Continent","")
      df1_liwc["Country"] = df_1["Country"]
      df1_liwc["Continent"] = df_1["Continent"]
      # Exclude USA
      df1_liwc = df1_liwc[df1_liwc['Country'] != "United States of America"]
      df1_liwc
[58]:
                                                    Source (B) Country Continent \
            Perhaps we find portents in curious places but...
      0
      1
            OFTEN, in the 23 years since I first joined Th...
                                                                Greece
                                                                          Europe
            Q. I recently created a key lime pie from one ...
                                                                 Spain
                                                                          Europe
            For SportsMonday By NELSON BRYANT ASHORT while... Canada
                                                                        Americas
            NOT long ago I had planned to serve four fairl...
      4
      1560 LEAD: PLAYING culinary ''Beat the Clock'' has ...
      1561 LEAD: THE local strawberry season has started...
                                                                         Europe
                                                                Italy
      1562 LEAD: DON'T think that because tomorrow is New... France
                                                                          Europe
      1563 LEAD: ONE of the treasures of the kitchen is a... France
                                                                          Europe
      1564 LEAD: DON'T think that because tomorrow is New... France
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      1561 STRAWBERRIES; COOKING AND COOKBOOKS
                       FOOD; RECIPES; CHRISTMAS
      1562
      1563
                 COOKING AND COOKBOOKS; RECIPES
      1564
                       FOOD; CHRISTMAS; RECIPES
                                                    Source (D) \
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                                       FOOD THE FISH OF POETS
      1
            EVOLUTION OF A RECIPE: VARIATIONS ON A VENERABL...
      2
                                        QUESTIONS AND ANSWERS
      3
                   OUTDOORS: BAYBERRIES ARE ALWAYS A GOOD PICK
      4
                                            60-MINUTE GOURMET
             FOOD; A Meal That Takes Imagination, Not All Day
      1560
      1561 FOOD; Strawberries Are Here and It's Time for ...
```

```
1562
                      FOOD; Christmas Just Keeps On Going
1563
               FOOD; Whipping Up Canapes on Short Notice
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                      FOOD; Christmas Just Keeps On Going
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```

[1409 rows x 101 columns]

# 4.1.1 Use groupby function to produce the mean value in each quantitative column for each country

```
[59]: groupby_coun_mean_df_1 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_coun_mean_df_1 = groupby_coun_mean_df_1.drop(groupby_coun_mean_df_1.

→index[0])
groupby_coun_mean_df_1 = groupby_coun_mean_df_1.drop("Source (F)",axis=1)
groupby_coun_mean_df_1
```

Afghanistan 2078.000000 94.380000 58.740000 18.370000 29.800000 Argentina 2667.000000 98.110000 52.030000 14.780000 27.710000 Armenia 4330.000000 93.470000 43.940000 24.620000 31.270000 Austria 1194.083333 95.870000 56.314167 14.162500 42.167500 Barbados 685.000000 88.370000 36.290000 25.670000 15.500000 Belgium 833.142857 97.494286 47.518571 20.001429 31.001429 Bermuda 541.000000 90.295000 48.145000 24.885000 23.545000 Brazil 1744.666667 95.586667 47.893333 18.612222 38.496667 Bulgaria 1118.000000 90.450000 42.540000 9.800000 35.120000 Burma 1912.000000 94.640000 63.310000 20.990000 24.930000 Canada 1059.692308 95.527692 48.241538 19.528462 41.510000 China 1402.625000 95.066641 48.824375 18.1228047 35.558750 Denmark 947.500000 89.425000 54.180000 10.857500 34.347500 Egypt 1174.250000 97.278333 55.270833 23.430833 39.959167 Estonia 899.000000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 98.645000 46.395000 14.622500 44.110000 India 1725.80000 99.7470000 61.54000 77.680000 18.345000 India 1725.80000 99.545000 56.04000 77.680000 18.345000 India 1994.000000 89.545000 56.040000 77.680000 18.345000 India 1994.000000 89.545000 56.04000 77.680000 18.345000 India 1994.000000 89.545000 56.04000 77.680000 18.345000 India 1994.000000 89.545000 56.04000 77.680000 18.345000 India 1994.000000 89.545000 51.050000 17.580000 28.2600000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jamaica 2673.000000 97.610000 59.700000 17.580000 28.2600000 Latvia 1996.000000 97.610000 59.700000 11.290000 28.2600000 Latvia 1996.000000 97.610000 59.700000 11.290000 28.2600000 Latvia 1996.000000 97.610000 59.700000 11.290000 28.2600000 Malaysia 1934.500000 97.710000 48.880000 14.080000 29.3700000 Malaysia 1934.500000 97.710000 48.880000 14.080000 29.3700000 Malaysia 1934.500000 97.71000	[59]:		WC	Analytic	Clout	Authentic	Tone	\
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Austria 1194.083333 95.870000 56.314167 14.162500 42.167500 Barbados 685.000000 88.370000 36.290000 25.670000 15.500000 Belgium 833.142857 97.494286 47.518571 20.001429 31.001429 Bermuda 541.000000 90.295000 48.145000 24.885000 23.545000 Brazil 1744.666667 95.586667 47.893333 18.612222 38.496667 Bulgaria 1118.000000 96.450000 42.540000 9.800000 35.120000 Burma 1912.000000 94.640000 63.310000 20.990000 24.930000 Canada 1059.692308 95.527692 48.241538 19.528462 41.510000 China 1402.625000 95.066641 48.824375 18.128047 35.558750 Denmark 947.500000 97.278333 55.270833 23.430833 39.959167 Estonia 899.00000 97.170000 60.540000 25.94000 52.92000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 98.950000 46.640000 7.640000 18.345000 India 1725.800000 98.956000 46.640000 7.640000 18.345000 India 1725.800000 98.956000 56.042000 17.586000 34.190000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.00000 97.40000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1644.125000 95.940000 51.050000 17.590000 28.260000 Luxembourg 2394.000000 97.740000 48.880000 14.326667 62.370000 Malaysia 1934.500000 97.740000 48.880000 14.326667 62.370000 Martinique 1348.000000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.000000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.00000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.112069 49.854483 17.680690 42.23793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
Barbados 685.00000 88.370000 36.290000 25.670000 15.500000 Belgium 833.142857 97.494286 47.518571 20.001429 31.001429 Bermuda 541.000000 90.295000 48.145000 24.885000 23.545000 Brazil 1744.666667 95.586667 47.893333 18.612222 38.496667 Bulgaria 1118.000000 96.450000 42.540000 9.800000 35.120000 Burma 1912.000000 94.640000 63.310000 20.990000 24.930000 Canada 1059.692308 95.527692 48.241538 19.528462 41.510000 China 1402.625000 95.066641 48.824375 18.128047 35.558750 Denmark 947.50000 89.425000 54.180000 10.857500 34.347500 Egypt 1174.250000 97.278333 55.270833 23.430833 39.959167 Estonia 899.00000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.04333 51.456667 18.25333 33.42.20000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 94.903600 52.015600 17.686000 31.194000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Israel 2143.000000 87.740000 66.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.05000 17.530000 30.500000 Italy 1384.706140 95.111140 49.08469 17.567368 39.806184 Jamaica 2673.00000 97.940000 51.050000 17.550000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.666463 Jersey 1614.125000 95.940000 51.050000 17.590000 28.260000 Jersey 1614.125000 95.940000 51.050000 17.590000 28.260000 Jersey 1614.125000 97.740000 51.050000 17.590000 28.260000 Jersey 1614.125000 97.740000 51.830000 17.590000 28.260000 Jersey 1614.125000 97.740000 51.830000 17.590000 28.260000 Jersey 1614.125000 97.740000 51.830000 14.026667 62.370000 Malaysia 1934.500000 97.740000 48.880000 14.026000 29.370000 Martinique 1348.000000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.000000 97.740000 58.854843 17.680690 42.423793 Morocco 1166.954545 95.111184 49.925455 18.417273 41.380909		Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
Belgium         833.142857         97.494286         47.518571         20.001429         31.001429           Bermuda         541.000000         90.295000         48.145000         24.885000         23.545000           Brazil         1744.666667         95.586667         47.893333         18.612222         38.496667           Bulgaria         1118.000000         96.450000         42.540000         9.800000         35.120000           Burma         1912.000000         94.640000         63.310000         20.990000         24.930000           Canada         1059.692308         95.527692         48.241538         19.528462         41.510000           China         1402.625000         95.066641         48.824375         18.128047         35.558750           Denmark         947.500000         89.425000         54.180000         10.857500         34.347500           Egypt         1174.250000         97.278333         55.270833         23.430833         39.59167           Estonia         899.000000         97.17000         60.540000         25.940000         52.920000           France         1526.578462         96.130708         50.012646         17.612769         41.174892           Georgia         2040.666667		Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
Bermuda         541.000000         90.295000         48.145000         24.885000         23.545000           Brazil         1744.666667         95.586667         47.893333         18.61222         38.496667           Bulgaria         1118.000000         96.450000         42.540000         9.800000         35.120000           Burma         1912.000000         94.640000         63.310000         20.990000         24.930000           Canada         1059.699308         95.527692         48.241538         19.528462         41.510000           China         1402.625000         95.066641         48.824375         18.128047         35.558750           Denmark         947.500000         89.425000         54.180000         10.857500         34.347500           Egypt         1174.250000         97.278333         55.270833         23.430833         39.959167           Estonia         899.000000         97.17000         60.54000         25.94000         52.920000           France         1526.578462         96.130708         50.012646         17.612769         41.174892         60000           Georgia         2040.666667         98.043333         51.456667         18.253333         34.220000           Germany		Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
Brazil 1744.666667 95.586667 47.893333 18.612222 38.496667 Bulgaria 1118.000000 96.450000 42.540000 9.800000 35.120000 Burma 1912.000000 94.6400000 63.310000 20.990000 24.930000 Canada 1059.692308 95.527692 48.241538 19.528462 41.510000 China 1402.625000 95.066641 48.824375 18.128047 35.558750 Denmark 947.50000 89.425000 54.180000 10.857500 34.347500 Egypt 1174.250000 97.278333 55.270833 23.430833 39.959167 Estonia 899.00000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 94.903600 52.015600 17.640000 18.345000 Italy 1384.706140 95.711140 49.084649 17.567368 39.806184 Jamaica 2673.00000 87.490000 51.870000 19.410000 43.746000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.00000 97.610000 59.700000 11.290000 28.260000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.6600000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000 Martinique 1348.000000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.000000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.000000 97.740000 42.640000 5.820000 21.2200000 Mexico 1166.954545 95.141818 49.725455 18.417273 41.380909		Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	
Bulgaria         1118.00000         96.450000         42.540000         9.800000         35.120000           Burma         1912.000000         94.640000         63.310000         20.990000         24.930000           Canada         1059.692308         95.527692         48.241538         19.528462         41.510000           China         1402.625000         95.066641         48.824375         18.128047         35.558750           Denmark         947.500000         89.425000         54.180000         10.857500         34.34750           Egypt         1174.250000         97.278333         55.270833         23.430833         39.959167           Estonia         899.00000         97.170000         60.540000         25.940000         52.920000           France         1526.578462         96.130708         50.012646         17.612769         41.174892           Georgia         2040.666667         98.043333         51.456667         18.253333         34.220000           Germany         1404.285714         94.748571         53.110000         15.520000         32.054286           Greece         1025.709677         95.969677         45.147742         15.301613         40.556452           Hungary         1649.250000		Bermuda	541.000000	90.295000	48.145000	24.885000	23.545000	
Burma 1912.000000 94.640000 63.310000 20.990000 24.930000 Canada 1059.692308 95.527692 48.241538 19.528462 41.510000 China 1402.625000 95.066641 48.824375 18.128047 35.558750 Demmark 947.500000 89.425000 54.180000 10.857500 34.347500 Egypt 1174.250000 97.278333 55.270833 23.430833 39.959167 Estonia 899.000000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.50000 95.740000 46.64000 7.64000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.940000 51.870000 17.590000 28.260000 Latvia 1999.33333 95.763333 59.640000 14.326667 62.3700000 Latvia 1999.33333 95.763333 59.640000 14.326667 62.3700000 Malaysia 1934.500000 97.740000 48.880000 14.326667 62.3700000 Malaysia 1934.500000 97.740000 48.880000 14.080000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1467.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Brazil	1744.666667	95.586667	47.893333	18.612222	38.496667	
Canada         1059.692308         95.527692         48.241538         19.528462         41.510000           China         1402.625000         95.066641         48.824375         18.128047         35.558750           Denmark         947.500000         89.425000         54.180000         10.857500         34.347500           Egypt         1174.250000         97.278333         55.270833         23.430833         39.959167           Estonia         899.00000         97.17000         60.54000         25.940000         52.92000           France         1526.578462         96.130708         50.012646         17.612769         41.174892           Georgia         2040.666667         98.043333         51.456667         18.253333         34.220000           Germany         1404.285714         94.748571         53.110000         15.520000         32.054286           Greece         1025.709677         95.969677         45.147742         15.301613         40.556452           Hungary         1649.250000         96.645000         46.395000         14.622500         44.110000           India         1725.800000         94.903600         52.015600         17.686000         31.194000           Ircland         1994.000000		Bulgaria	1118.000000	96.450000	42.540000	9.800000	35.120000	
China         1402.625000         95.066641         48.824375         18.128047         35.558750           Denmark         947.500000         89.425000         54.180000         10.857500         34.347500           Egypt         1174.250000         97.278333         55.270833         23.430833         39.959167           Estonia         899.000000         97.170000         60.540000         25.940000         52.920000           France         1526.578462         96.130708         50.012646         17.612769         41.174892           Georgia         2040.666667         98.043333         51.456667         18.253333         34.220000           Germany         1404.285714         94.748571         53.110000         15.520000         32.054286           Greece         1025.709677         95.969677         45.147742         15.301613         40.556452           Hungary         1649.250000         96.645000         46.395000         14.622500         44.110000           India         1725.800000         94.903600         52.015600         17.686000         31.194000           Indonesia         1516.500000         95.740000         46.640000         7.640000         18.345000           Ireland         1994.000000		Burma	1912.000000	94.640000	63.310000	20.990000	24.930000	
Denmark         947.500000         89.425000         54.180000         10.857500         34.347500           Egypt         1174.250000         97.278333         55.270833         23.430833         39.959167           Estonia         899.000000         97.170000         60.540000         25.940000         52.920000           France         1526.578462         96.130708         50.012646         17.612769         41.174892           Georgia         2040.666667         98.043333         51.456667         18.253333         34.220000           Germany         1404.285714         94.748571         53.110000         15.520000         32.054286           Greece         1025.709677         95.969677         45.147742         15.301613         40.556452           Hungary         1649.250000         96.645000         46.395000         14.622500         44.110000           India         1725.800000         94.903600         52.015600         17.686000         31.194000           Indonesia         1516.500000         95.74000         46.640000         7.640000         18.345000           Ireland         1994.000000         89.526000         56.042000         19.410000         43.746000           Israel         2143.000000		Canada	1059.692308	95.527692	48.241538	19.528462	41.510000	
Egypt 1174.250000 97.278333 55.270833 23.430833 39.959167 Estonia 899.000000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 96.645000 46.395000 14.622500 44.110000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.925000 47.405000 18.570000 26.600000 Latvia 1996.000000 97.610000 59.700000 14.326667 62.370000 Latvia 1996.000000 97.610000 59.700000 14.326667 62.370000 Malaysia 1934.500000 94.100000 48.880000 14.080000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		China	1402.625000	95.066641	48.824375	18.128047	35.558750	
Estonia 899.000000 97.170000 60.540000 25.940000 52.920000 France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 96.645000 46.395000 14.622500 44.110000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 97.610000 59.700000 11.290000 26.6000000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.6000000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.6000000 Malaysia 1934.500000 94.100000 42.640000 5.820000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 29.370000 Mexico 1467.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Denmark	947.500000	89.425000	54.180000	10.857500	34.347500	
France 1526.578462 96.130708 50.012646 17.612769 41.174892 Georgia 2040.666667 98.043333 51.456667 18.253333 34.220000 Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 94.903600 52.015600 17.686000 31.194000 India 1725.800000 95.740000 46.645000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.6000000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.3700000 Malaysia 1934.500000 94.100000 48.880000 14.080000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Egypt	1174.250000	97.278333	55.270833	23.430833	39.959167	
Georgia2040.66666798.04333351.45666718.25333334.220000Germany1404.28571494.74857153.11000015.52000032.054286Greece1025.70967795.96967745.14774215.30161340.556452Hungary1649.25000096.64500046.39500014.62250044.110000India1725.80000094.90360052.01560017.68600031.194000Indonesia1516.50000095.74000046.6400007.64000018.345000Ireland1994.00000089.52600056.04200019.41000043.746000Israel2143.00000087.49000051.87000017.53000030.500000Italy1384.70614095.11114049.08464917.56736839.806184Jamaica2673.00000095.94000051.05000017.59000028.260000Japan1699.53571495.61035750.46964318.33214343.664643Jersey1614.12500095.92500047.40500018.57000042.515000Latvia1996.00000097.61000059.70000011.29000026.600000Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.141818<		Estonia	899.000000	97.170000	60.540000	25.940000	52.920000	
Germany 1404.285714 94.748571 53.110000 15.520000 32.054286 Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 96.645000 46.395000 14.622500 44.110000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.6000000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000 Malaysia 1934.500000 94.100000 48.880000 14.080000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		France	1526.578462	96.130708	50.012646	17.612769	41.174892	
Greece 1025.709677 95.969677 45.147742 15.301613 40.556452 Hungary 1649.250000 96.645000 46.395000 14.622500 44.110000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.600000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000 Malaysia 1934.500000 97.740000 51.840000 21.620000 47.390000 Martinique 1348.000000 92.1700000 42.640000 5.820000 21.2200000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Georgia	2040.666667	98.043333	51.456667	18.253333	34.220000	
Hungary 1649.250000 96.645000 46.395000 14.622500 44.110000 India 1725.800000 94.903600 52.015600 17.686000 31.194000 Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000 Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000 Israel 2143.000000 87.490000 51.870000 17.530000 30.500000 Italy 1384.706140 95.111140 49.084649 17.567368 39.806184 Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000 Japan 1699.535714 95.610357 50.469643 18.332143 43.664643 Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.600000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000 Malaysia 1934.500000 97.740000 51.840000 21.620000 47.390000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Germany	1404.285714	94.748571	53.110000	15.520000	32.054286	
India       1725.800000       94.903600       52.015600       17.686000       31.194000         Indonesia       1516.500000       95.740000       46.640000       7.640000       18.345000         Ireland       1994.000000       89.526000       56.042000       19.410000       43.746000         Israel       2143.000000       87.490000       51.870000       17.530000       30.500000         Italy       1384.706140       95.111140       49.084649       17.567368       39.806184         Jamaica       2673.000000       95.940000       51.050000       17.590000       28.260000         Japan       1699.535714       95.610357       50.469643       18.332143       43.664643         Jersey       1614.125000       95.925000       47.405000       18.570000       42.515000         Latvia       1996.000000       97.610000       59.700000       11.290000       26.600000         Lebanon       1979.333333       95.763333       59.640000       14.326667       62.370000         Malaysia       1934.500000       94.100000       48.880000       14.080000       29.370000         Martinique       1348.000000       92.170000       42.640000       5.820000       21.220000		Greece	1025.709677	95.969677	45.147742	15.301613	40.556452	
Indonesia 1516.500000 95.740000 46.640000 7.640000 18.345000   Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000   Israel 2143.000000 87.490000 51.870000 17.530000 30.500000   Italy 1384.706140 95.111140 49.084649 17.567368 39.806184   Jamaica 2673.000000 95.940000 51.050000 17.590000 28.260000   Japan 1699.535714 95.610357 50.469643 18.332143 43.664643   Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000   Latvia 1996.000000 97.610000 59.700000 11.290000 26.600000   Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000   Luxembourg 2394.000000 97.740000 51.840000 21.620000 47.390000   Malaysia 1934.500000 94.100000 48.880000 14.080000 29.370000   Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000   Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793   Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Hungary	1649.250000	96.645000	46.395000	14.622500	44.110000	
Ireland 1994.000000 89.526000 56.042000 19.410000 43.746000		India	1725.800000	94.903600	52.015600	17.686000	31.194000	
Israel2143.00000087.49000051.87000017.53000030.500000Italy1384.70614095.11114049.08464917.56736839.806184Jamaica2673.00000095.94000051.05000017.59000028.260000Japan1699.53571495.61035750.46964318.33214343.664643Jersey1614.12500095.92500047.40500018.57000042.515000Latvia1996.00000097.61000059.70000011.29000026.600000Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Indonesia	1516.500000	95.740000	46.640000	7.640000	18.345000	
Italy       1384.706140       95.111140       49.084649       17.567368       39.806184         Jamaica       2673.000000       95.940000       51.050000       17.590000       28.260000         Japan       1699.535714       95.610357       50.469643       18.332143       43.664643         Jersey       1614.125000       95.925000       47.405000       18.570000       42.515000         Latvia       1996.000000       97.610000       59.700000       11.290000       26.600000         Lebanon       1979.3333333       95.763333       59.640000       14.326667       62.370000         Luxembourg       2394.000000       97.740000       51.840000       21.620000       47.390000         Malaysia       1934.500000       94.100000       48.880000       14.080000       29.370000         Martinique       1348.000000       92.170000       42.640000       5.820000       21.220000         Mexico       1447.896552       95.712069       49.854483       17.680690       42.423793         Morocco       1166.954545       95.141818       49.725455       18.417273       41.380909		Ireland	1994.000000	89.526000	56.042000	19.410000	43.746000	
Jamaica2673.00000095.94000051.05000017.59000028.260000Japan1699.53571495.61035750.46964318.33214343.664643Jersey1614.12500095.92500047.40500018.57000042.515000Latvia1996.00000097.61000059.70000011.29000026.600000Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Israel	2143.000000	87.490000	51.870000	17.530000	30.500000	
Japan1699.53571495.61035750.46964318.33214343.664643Jersey1614.12500095.92500047.40500018.57000042.515000Latvia1996.00000097.61000059.70000011.29000026.600000Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Italy	1384.706140	95.111140	49.084649	17.567368	39.806184	
Jersey 1614.125000 95.925000 47.405000 18.570000 42.515000 Latvia 1996.000000 97.610000 59.700000 11.290000 26.600000 Lebanon 1979.333333 95.763333 59.640000 14.326667 62.370000 Luxembourg 2394.000000 97.740000 51.840000 21.620000 47.390000 Malaysia 1934.500000 94.100000 48.880000 14.080000 29.370000 Martinique 1348.000000 92.170000 42.640000 5.820000 21.220000 Mexico 1447.896552 95.712069 49.854483 17.680690 42.423793 Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Jamaica	2673.000000	95.940000	51.050000	17.590000	28.260000	
Latvia1996.00000097.61000059.70000011.29000026.600000Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Japan	1699.535714	95.610357	50.469643	18.332143	43.664643	
Lebanon1979.33333395.76333359.64000014.32666762.370000Luxembourg2394.00000097.74000051.84000021.62000047.390000Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Jersey	1614.125000	95.925000	47.405000	18.570000	42.515000	
Luxembourg       2394.000000       97.740000       51.840000       21.620000       47.390000         Malaysia       1934.500000       94.100000       48.880000       14.080000       29.370000         Martinique       1348.000000       92.170000       42.640000       5.820000       21.220000         Mexico       1447.896552       95.712069       49.854483       17.680690       42.423793         Morocco       1166.954545       95.141818       49.725455       18.417273       41.380909		Latvia	1996.000000	97.610000	59.700000	11.290000	26.600000	
Malaysia1934.50000094.10000048.88000014.08000029.370000Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Lebanon	1979.333333	95.763333	59.640000	14.326667	62.370000	
Martinique1348.00000092.17000042.6400005.82000021.220000Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Luxembourg	2394.000000	97.740000	51.840000	21.620000	47.390000	
Mexico1447.89655295.71206949.85448317.68069042.423793Morocco1166.95454595.14181849.72545518.41727341.380909		Malaysia	1934.500000	94.100000	48.880000	14.080000	29.370000	
Morocco 1166.954545 95.141818 49.725455 18.417273 41.380909		Martinique	1348.000000	92.170000	42.640000	5.820000	21.220000	
		Mexico	1447.896552	95.712069	49.854483	17.680690	42.423793	
Netherlands 1650.142857 94.834286 54.525000 13.259286 41.741429		Morocco	1166.954545	95.141818	49.725455	18.417273	41.380909	
		Netherlands	1650.142857	94.834286	54.525000	13.259286	41.741429	

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Norway
                     1453.000000
                                   95.360000
                                               48.900000
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Palestine
                     1909.000000
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Peru
                      978.000000
                                   96.814000
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                                                                       27.174000
Poland
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                                   91.037500
                                               45.872500
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                                                                       42.110000
Portugal
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Russian Federation
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                                   95.214000
                                               49.008000
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Singapore
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                                               57.875000
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Spain
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Sweden
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Switzerland
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Syria
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Thailand
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Turkey
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United Kingdom
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Vietnam
                     2016.166667
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Country
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Afghanistan
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Argentina
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Armenia
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Austria
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Barbados
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Belgium
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Bermuda
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Brazil
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Bulgaria
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Burma
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Canada
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China
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Denmark
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Egypt
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Estonia
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France
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Georgia
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Germany
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Greece
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Hungary
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India
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Indonesia
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Ireland
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Israel
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Italy
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Jamaica
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Japan
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Jersey
                     16.186250
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Latvia
                     13.770000
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                                             70.940000
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Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667 .	
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000 .	
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000 .	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000 .	
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690 .	
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000 .	
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286 .	
Norway	18.390000	18.860000	66.690000	36.340000	2.960000 .	
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000 .	
Peru	12.648000	17.694000	64.694000	35.894000	2.342000 .	
Poland	15.837500	17.127500	69.510000	37.850000	5.610000 .	
Portugal	13.598333	19.120000	70.511667	39.573333	6.020000 .	
Russian Federation	12.856000	18.190000	65.362000	35.560000	3.202000 .	
Singapore	16.845000	19.620000	71.405000	37.830000	3.595000 .	
Spain	14.534250	18.534500	68.586500	38.346250	3.595000 .	
Sweden	13.571429	19.244286	65.941429	34.744286	3.494286 .	
Switzerland	14.965385	18.973077	67.793846	37.250769	3.877692 .	
Syria	14.580000	21.430000	72.860000	38.710000	3.290000 .	
Thailand	15.767143	19.845714	67.105714	36.802857	4.047143 .	
Turkey	13.855000	19.630000	65.350000	36.353333	3.866667 .	
United Kingdom	13.719412	17.574118	68.757647	38.407647	4.081765 .	
Vietnam	15.136667	19.066667	67.590000	37.188333	4.503333 .	
	Comma	Colon	SemiC	QMark	Exclam \	
Country						
Afghanistan	7.600000				000000	
Argentina	6.660000				000000	
Armenia	6.210000				000000	
Austria	5.333333				000000	
Barbados	5.840000				000000	
Belgium	5.490000				000000	
Bermuda	4.840000				000000	
Brazil	6.341111				011111	
Bulgaria	5.460000				000000	
Burma	6.540000				050000	
Canada	4.960769				000000	
China	5.492500				002812	
Denmark	6.440000				000000	
Egypt	5.274167				000000	
Estonia	5.780000				000000	
France	5.226800				004154	
Georgia	5.560000				016667	
Germany	4.552857				000000	
Greece	5.346129				000000	
Hungary	4.495000				000000	
India	6.070800				006000	
Indonesia	6.570000	0.375000 (	0.180000 0	.000000 0.	000000	

Ireland	5.504000	0.800000	0.210000	0.332000	0.000000
Israel	6.350000	0.470000	0.050000	0.000000	0.000000
Italy	5.460132	0.601667	0.125175	0.030044	0.004868
Jamaica	8.190000	0.340000	0.040000	0.000000	0.000000
Japan	5.297500	0.683214	0.130000	0.017500	0.004643
Jersey	7.520000	0.372500	0.068750	0.018750	0.000000
Latvia	7.520000	0.350000	0.100000	0.000000	0.000000
Lebanon	6.520000	0.356667	0.273333	0.000000	0.026667
Luxembourg	5.680000	0.330000	0.080000	0.000000	0.000000
Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
~	Dash	Quote	Apostro	Parenth	OtherP
Country					
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000

```
France
                   1.153569
                             0.004892
                                       1.444185
                                                 0.876677
                                                           1.249108
Georgia
                             0.000000
                                       1.450000
                   0.943333
                                                 0.526667
                                                           2.063333
Germany
                   1.372857
                             0.004286
                                       1.282857
                                                 0.301429
                                                          3.200000
Greece
                             0.006452
                                       0.725161
                                                 0.410968 1.102581
                   1.011613
                             0.000000
Hungary
                   0.982500
                                       0.560000
                                                 0.612500 2.255000
India
                             0.000000
                                       1.991200
                                                 0.691200 2.030400
                   1.351600
Indonesia
                   1.430000
                             0.030000
                                       0.665000
                                                 1.780000 1.580000
Ireland
                   1.330000
                             0.000000
                                       3.254000
                                                 0.616000 1.206000
Israel
                   1.070000
                             0.000000
                                       3.450000
                                                 0.930000 1.260000
Italy
                                       1.355307
                   1.134518
                             0.004561
                                                 0.780746 1.277851
Jamaica
                   1.270000
                             0.000000
                                       1.420000
                                                 1.720000 2.920000
Japan
                   1.207857
                             0.000000
                                       1.271429
                                                 0.810000 1.641071
Jersey
                   0.841250
                             0.000000
                                       1.142500
                                                 1.323750 3.186250
Latvia
                   1.500000
                             0.000000
                                       5.760000
                                                 0.200000 2.710000
Lebanon
                             0.000000
                                       1.510000
                                                 0.690000 1.386667
                   1.040000
Luxembourg
                   2.800000
                             0.000000
                                       2.300000
                                                 0.630000 1.040000
Malaysia
                             0.000000
                                       1.440000
                                                 0.530000 4.075000
                   1.375000
                                       0.300000
Martinique
                   1.410000
                             0.000000
                                                 0.590000
                                                          6.080000
Mexico
                   1.539828
                             0.001552
                                       1.297759
                                                 0.895690 1.517241
                             0.000000
Morocco
                   0.961364
                                       0.535455
                                                 0.841364 1.594545
Netherlands
                   1.603571
                             0.000000
                                       2.865000
                                                 0.672857
                                                          1.208571
                             0.000000
Norway
                   0.760000
                                       0.140000
                                                 2.060000 1.650000
Palestine
                             0.000000
                                       3.820000
                                                 0.840000 0.470000
                   1.520000
Peru
                   1.168000
                             0.000000
                                       0.572000
                                                 0.368000 0.656000
Poland
                             0.000000
                   1.010000
                                       2.065000
                                                 0.880000
                                                          0.865000
Portugal
                   1.391667
                             0.028333
                                       4.128333
                                                 0.825000 1.115000
Russian Federation
                   1.280000
                             0.000000
                                       1.440000
                                                 1.126000 1.060000
Singapore
                   1.110000
                             0.000000
                                       2.310000
                                                 0.235000 0.760000
                                       1.062000
Spain
                   1.196750
                             0.002000
                                                 0.897000 1.733500
Sweden
                             0.004286
                                       2.001429
                                                 1.207143 1.084286
                   1.035714
Switzerland
                   1.075385
                             0.003846
                                       1.330769
                                                 0.756923 1.960769
Syria
                             0.000000
                                       3.000000
                                                 0.860000 0.430000
                   2.570000
Thailand
                   1.134286
                             0.000000
                                       2.298571
                                                 1.081429 1.437143
Turkey
                   1.031667
                             0.000000
                                       1.600000
                                                 0.430000
                                                          0.946667
United Kingdom
                             0.000000
                                       1.460000
                                                 0.935294
                   0.970000
                                                          1.944118
Vietnam
                   1.126667
                             0.000000
                                       2.645000
                                                 1.141667
                                                           1.460000
```

[51 rows x 93 columns]

# 4.1.2 Use groupby function to produce the mean value in each quantitative column for each continent

```
[60]: groupby_con_mean_df_1 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_con_mean_df_1 = groupby_con_mean_df_1.drop(groupby_con_mean_df_1.

→index[0])
groupby_con_mean_df_1 = groupby_con_mean_df_1.drop("Source (F)",axis=1)
groupby_con_mean_df_1
```

[60]:		WC	Analytic	Clout	Authentic	Tone	\
	Country						
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium Bermuda	833.142857	97.494286	47.518571 48.145000	20.001429 24.885000	31.001429	
	Brazil	541.000000 1744.666667	90.295000 95.586667	47.893333	18.612222	23.545000 38.496667	
	Bulgaria	1118.000007	96.450000	42.540000	9.800000	35.120000	
	Burma	1912.000000	94.640000	63.310000	20.990000	24.930000	
	Canada	1059.692308	95.527692	48.241538	19.528462	41.510000	
	China	1402.625000	95.066641	48.824375	18.128047	35.558750	
	Denmark	947.500000	89.425000	54.180000	10.857500	34.347500	
	Egypt	1174.250000	97.278333	55.270833	23.430833	39.959167	
	Estonia	899.000000	97.170000	60.540000	25.940000	52.920000	
	France	1526.578462	96.130708	50.012646	17.612769	41.174892	
	Georgia	2040.666667	98.043333	51.456667	18.253333	34.220000	
	Germany	1404.285714	94.748571	53.110000	15.520000	32.054286	
	Greece	1025.709677	95.969677	45.147742	15.301613	40.556452	
	Hungary	1649.250000	96.645000	46.395000	14.622500	44.110000	
	India	1725.800000	94.903600	52.015600	17.686000	31.194000	
	Indonesia	1516.500000	95.740000	46.640000	7.640000	18.345000	
	Ireland	1994.000000	89.526000	56.042000	19.410000	43.746000	
	Israel	2143.000000	87.490000	51.870000	17.530000	30.500000	
	Italy	1384.706140	95.111140	49.084649	17.567368	39.806184	
	Jamaica	2673.000000	95.940000	51.050000	17.590000	28.260000	
	Japan	1699.535714	95.610357	50.469643	18.332143	43.664643	
	Jersey	1614.125000	95.925000	47.405000	18.570000	42.515000	
	Latvia	1996.000000	97.610000	59.700000	11.290000	26.600000	
	Lebanon	1979.333333	95.763333	59.640000	14.326667	62.370000	
	Luxembourg Malaysia	2394.000000 1934.500000	97.740000 94.100000	51.840000 48.880000	21.620000 14.080000	47.390000 29.370000	
	Martinique	1348.000000	92.170000	42.640000	5.820000	21.220000	
	Mexico	1447.896552	95.712069	49.854483	17.680690	42.423793	
	Morocco	1166.954545	95.141818	49.725455	18.417273	41.380909	
	Netherlands	1650.142857	94.834286	54.525000	13.259286	41.741429	
	Norway	1453.000000	95.360000	48.900000	11.630000	22.570000	
	Palestine	1909.000000	95.720000	64.710000	12.660000	54.370000	
	Peru	978.000000	96.814000	48.882000	8.342000	27.174000	
	Poland	1450.750000	91.037500	45.872500	14.687500	42.110000	
	Portugal	1766.666667	91.348333	54.671667	17.136667	46.013333	
	Russian Federation	1465.200000	95.214000	49.008000	12.566000	43.070000	
	Singapore	1710.000000	95.510000	57.875000	14.825000	52.060000	
	Spain	1180.925000	95.416250	48.128000	19.387250	38.898750	
	Sweden	2310.142857	95.510000	48.870000	15.304286	42.837143	

Switzerland	2088.461538	8 95.96307	7 48.57615	4 13.41153	8 37.2307	69
Syria	700.000000					
Thailand	1892.857143					
Turkey	966.833333					
United Kingdom	1443.647059					
Vietnam	2016.166667					
V 10 onam	2010.10000	30.0000	00.10000	0 10.22000	0 12.0010	01
	WPS	Sixltr	Dic	function	pronoun	\
Country					•	
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	
•						

Peru	12.648000	17.694000	64.694000	35.894000	2.342000
Poland	15.837500		69.510000	37.850000	
Portugal	13.598333		70.511667	39.573333	
Russian Federation	12.856000	18.190000	65.362000	35.560000	
Singapore	16.845000		71.405000	37.830000	
Spain	14.534250		68.586500	38.346250	
Sweden	13.571429		65.941429	34.744286	
Switzerland	14.965385	18.973077	67.793846	37.250769	
Syria	14.580000		72.860000	38.710000	
Thailand	15.767143		67.105714	36.802857	
Turkey	13.855000	19.630000	65.350000	36.353333	
United Kingdom	13.719412		68.757647	38.407647	
Vietnam	15.136667		67.590000	37.188333	
	Comma	Colon	SemiC	QMark	Exclam \
Country				•	·
Afghanistan	7.600000	0.290000 0	.140000 0	.000000 0.	000000
Argentina	6.660000			.000000 0.	000000
Armenia	6.210000	0.300000 0	.050000 0	.000000 0.	000000
Austria	5.333333		.085000 0	.071667 0.	000000
Barbados	5.840000	0.290000 0	.150000 0		000000
Belgium	5.490000	0.390000 0	.255714 0	.000000 0.	000000
Bermuda	4.840000	0.505000 0	.235000 0	.305000 0.	000000
Brazil	6.341111	0.320000 0	.076667 0	.032222 0.	011111
Bulgaria	5.460000	0.540000 0	.090000 0	.000000 0.	000000
Burma	6.540000	1.150000 0	.210000 0	.000000 0.	050000
Canada	4.960769	0.364615 0	.065385 0	.000000 0.	000000
China	5.492500	0.581406 0	.168281 0	.035469 0.	002812
Denmark	6.440000	0.605000 0	.015000 0	.132500 0.	000000
Egypt	5.274167	0.928333 0	.063333 0	.011667 0.	000000
Estonia	5.780000	0.330000 0	.110000 0	.110000 0.	000000
France	5.226800	0.526092 0	.117200 0	.035785 0.	004154
Georgia	5.560000	0.356667 0	.086667 0	.013333 0.	016667
Germany	4.552857	0.454286 0	.184286 0	.085714 0.	000000
Greece	5.346129	0.605161 0	.123871 0	.000000 0.	000000
Hungary	4.495000	0.487500 0	.235000 0	.000000 0.	000000
India	6.070800	0.469200 0	.136800 0	.014400 0.	006000
Indonesia	6.570000	0.375000 0	.180000 0	.000000 0.	000000
Ireland	5.504000	0.800000 0	.210000 0	.332000 0.	000000
Israel	6.350000	0.470000 0	.050000 0	.000000 0.	000000
Italy	5.460132	0.601667 0	.125175 0	.030044 0.	004868
Jamaica	8.190000	0.340000 0	.040000 0	.000000 0.	000000
Japan	5.297500	0.683214 0	.130000 0	.017500 0.	004643
Jersey	7.520000	0.372500 0	.068750 0	.018750 0.	000000
Latvia	7.520000	0.350000 0	.100000 0	.000000 0.	000000
Lebanon	6.520000	0.356667 0	.273333 0	.000000 0.	026667
Luxembourg	5.680000	0.330000 0	.080000 0	.000000 0.	000000

Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
	Dash	Quote	Apostro	Parenth	OtherP
Country			_		
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
Georgia	0.943333	0.000000	1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000

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Italy
                               0.004561
                                          1.355307
                                                    0.780746
                                                              1.277851
                     1.134518
Jamaica
                               0.000000
                                                    1.720000
                                                              2.920000
                     1.270000
                                          1.420000
Japan
                     1.207857
                               0.000000
                                          1.271429
                                                    0.810000
                                                              1.641071
Jersey
                     0.841250
                               0.000000
                                          1.142500
                                                    1.323750
                                                              3.186250
Latvia
                     1.500000
                               0.000000
                                          5.760000
                                                    0.200000
                                                              2.710000
Lebanon
                               0.000000
                                          1.510000
                                                    0.690000
                     1.040000
                                                              1.386667
Luxembourg
                     2.800000
                               0.000000
                                          2.300000
                                                    0.630000
                                                              1.040000
Malaysia
                     1.375000
                               0.000000
                                          1.440000
                                                    0.530000
                                                              4.075000
Martinique
                               0.000000
                                          0.300000
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                                                              6.080000
                     1.410000
Mexico
                     1.539828
                               0.001552
                                          1.297759
                                                    0.895690
                                                              1.517241
Morocco
                     0.961364
                               0.000000
                                          0.535455
                                                    0.841364
                                                              1.594545
Netherlands
                               0.000000
                                          2.865000
                     1.603571
                                                    0.672857
                                                              1.208571
Norway
                     0.760000
                               0.000000
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Palestine
                     1.520000
                               0.000000
                                          3.820000
                                                    0.840000
                                                              0.470000
Peru
                               0.000000
                                          0.572000
                                                    0.368000
                                                              0.656000
                     1.168000
Poland
                     1.010000
                               0.000000
                                          2.065000
                                                    0.880000
                                                              0.865000
Portugal
                                          4.128333
                     1.391667
                               0.028333
                                                    0.825000
                                                              1.115000
Russian Federation
                     1.280000
                               0.000000
                                          1.440000
                                                    1.126000
                                                              1.060000
Singapore
                     1.110000
                               0.000000
                                          2.310000
                                                    0.235000
                                                              0.760000
                                                    0.897000
Spain
                     1.196750
                               0.002000
                                          1.062000
                                                              1.733500
Sweden
                     1.035714
                               0.004286
                                          2.001429
                                                    1.207143
                                                              1.084286
Switzerland
                               0.003846
                                          1.330769
                                                    0.756923
                                                              1.960769
                     1.075385
Syria
                     2.570000
                               0.000000
                                          3.000000
                                                    0.860000
                                                              0.430000
Thailand
                     1.134286
                               0.000000
                                          2.298571
                                                    1.081429
                                                              1.437143
Turkey
                     1.031667
                               0.000000
                                          1.600000
                                                    0.430000
                                                              0.946667
United Kingdom
                     0.970000
                               0.000000
                                          1.460000
                                                    0.935294
                                                              1.944118
                               0.000000
                                                    1.141667
Vietnam
                     1.126667
                                          2.645000
                                                               1.460000
```

[51 rows x 93 columns]

#### 4.1.3 Show only the columns of "Affective processes" and its sub-codes

1]: groupby_coun_me	an_df_1[['affe	ect','posem	no', 'negen	no', 'anx',	'anger',	'sad']]
1]:	affect	posemo	negemo	anx	anger	sad
Country						
Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000
Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000
Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000
Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167
Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.000000
Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143
Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000
Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778
Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000
Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000
Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769

```
China
                    2.635078
                               1.560156
                                         1.043281
                                                    0.049766
                                                              0.481250
                                                                         0.196094
Denmark
                    3.295000
                               1.862500
                                         1.370000
                                                    0.140000
                                                              0.402500
                                                                         0.297500
Egypt
                    2.270000
                               1.510000
                                         0.730833
                                                    0.065833
                                                              0.330000
                                                                         0.044167
Estonia
                    2.780000
                               2.110000
                                         0.670000
                                                    0.000000
                                                              0.440000
                                                                         0.000000
France
                               1.757415
                                         0.928062
                                                    0.086862
                                                              0.365077
                    2.739415
                                                                         0.143200
Georgia
                    2.493333
                               1.416667
                                         0.966667
                                                    0.090000
                                                              0.393333
                                                                         0.043333
                                                              0.534286
Germany
                    2.295714
                               1.312857
                                         0.982857
                                                    0.092857
                                                                         0.195714
Greece
                    2.128387
                               1.460323
                                         0.653871
                                                    0.069355
                                                              0.220323
                                                                         0.173226
Hungary
                    2.382500
                               1.687500
                                         0.695000
                                                    0.055000
                                                              0.220000
                                                                         0.075000
India
                                         1.182400
                                                              0.644000
                    2.718000
                               1.474000
                                                    0.052000
                                                                         0.184800
Indonesia
                    3.265000
                               1.345000
                                         1.925000
                                                    0.030000
                                                              1.015000
                                                                         0.075000
Ireland
                    3.080000
                               2.024000
                                         1.044000
                                                    0.100000
                                                              0.448000
                                                                         0.148000
Israel
                    2.150000
                               1.210000
                                         0.930000
                                                    0.090000
                                                              0.470000
                                                                         0.190000
Italy
                    2.634868
                               1.678465
                                         0.923816
                                                    0.087325
                                                              0.358465
                                                                         0.176316
Jamaica
                    2.580000
                               1.350000
                                         1.200000
                                                    0.070000
                                                              0.670000
                                                                         0.150000
Japan
                    2.291071
                               1.596071
                                         0.636786
                                                    0.069286
                                                              0.279643
                                                                         0.110357
Jersey
                               1.933750
                                         1.016250
                                                    0.042500
                                                              0.577500
                                                                         0.257500
                    2.957500
                                                              0.350000
Latvia
                    2.350000
                               1.200000
                                         1.150000
                                                    0.000000
                                                                         0.200000
Lebanon
                    3.223333
                               2.590000
                                         0.616667
                                                    0.156667
                                                              0.173333
                                                                         0.073333
Luxembourg
                               1.800000
                                                    0.000000
                                                              0.290000
                                                                         0.080000
                    2.420000
                                         0.630000
Malaysia
                    2.945000
                               1.515000
                                         1.335000
                                                    0.210000
                                                              0.525000
                                                                         0.060000
                                                              0.890000
                                         1.630000
Martinique
                    2.970000
                               1.340000
                                                    0.150000
                                                                         0.070000
Mexico
                    2.617414
                               1.745690
                                         0.846034
                                                    0.087069
                                                              0.329655
                                                                         0.134828
Morocco
                    2.416364
                               1.610000
                                         0.776818
                                                    0.010909
                                                              0.361818
                                                                         0.148636
Netherlands
                                         0.925714
                                                              0.427143
                    2.738571
                               1.794286
                                                    0.058571
                                                                         0.155000
Norway
                    3.230000
                               1.510000
                                         1.720000
                                                    0.000000
                                                              0.690000
                                                                         0.140000
                                                                         0.050000
Palestine
                    3.090000
                               2.300000
                                         0.790000
                                                    0.050000
                                                              0.370000
Peru
                                                    0.026000
                                                              0.480000
                    2.462000
                               1.260000
                                         1.194000
                                                                         0.158000
Poland
                    2.607500
                               1.732500
                                         0.840000
                                                    0.060000
                                                              0.370000
                                                                         0.150000
                                                    0.030000
                                                              0.345000
Portugal
                    3.133333
                               2.103333
                                         1.015000
                                                                         0.286667
Russian Federation
                                         0.846000
                                                    0.036000
                                                              0.298000
                    2.674000
                               1.790000
                                                                         0.108000
Singapore
                    3.565000
                               2.485000
                                         1.085000
                                                    0.000000
                                                              0.615000
                                                                         0.060000
Spain
                    2.604250
                               1.636500
                                         0.931000
                                                    0.099750
                                                              0.406000
                                                                         0.163000
Sweden
                    2.962857
                               1.934286
                                         1.000000
                                                    0.190000
                                                              0.384286
                                                                         0.140000
Switzerland
                                                              0.468462
                    3.032308
                               1.784615
                                         1.144615
                                                    0.147692
                                                                         0.145385
Syria
                    3.570000
                               2.570000
                                         1.000000
                                                    0.140000
                                                              0.290000
                                                                         0.290000
Thailand
                               1.511429
                                         0.922857
                                                              0.372857
                    2.557143
                                                    0.057143
                                                                         0.048571
Turkey
                               1.535000
                                         0.793333
                                                    0.130000
                                                              0.420000
                    2.328333
                                                                         0.125000
United Kingdom
                    3.079412
                               1.823529
                                         1.206471
                                                    0.077647
                                                              0.408824
                                                                         0.241765
Vietnam
                    2.860000
                               1.853333
                                         0.926667
                                                              0.368333
                                                    0.068333
                                                                         0.120000
groupby_con_mean_df_1[['affect','posemo', 'negemo',
                                                      'anx',
                                                              'anger',
                                                                       'sad']]
                       affect
                                                                              sad
                                 posemo
                                           negemo
                                                                 anger
                                                         anx
Country
                                                    0.000000
Afghanistan
                    2.940000
                               1.590000
                                         1.350000
                                                              0.430000
                                                                         0.140000
```

0.740000

0.040000

0.350000

0.040000

0.860000

1.600000

[62]:

[62]:

Argentina

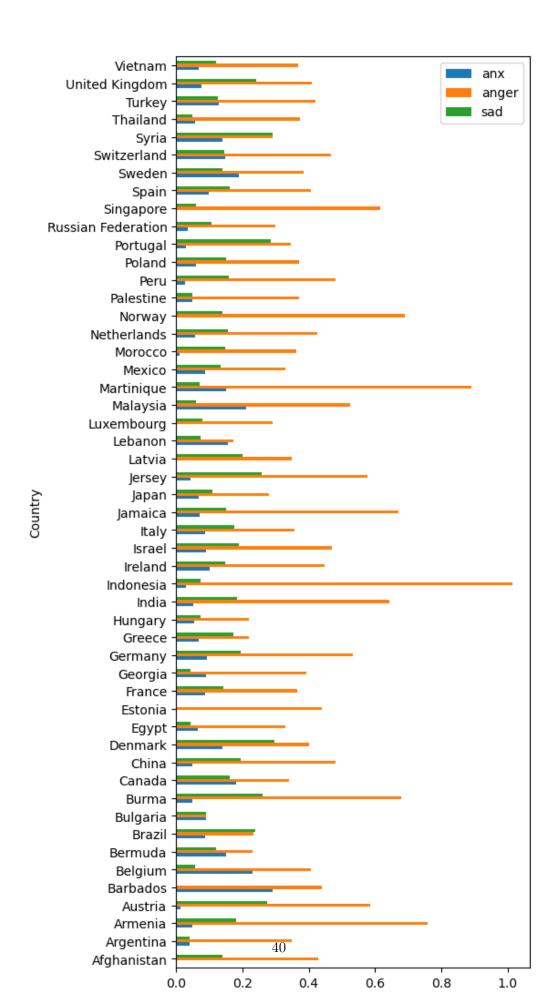
Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000
		1.855833		0.030000	0.700000	
Austria	2.810833		0.956667			0.274167
Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.000000
Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143
Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000
Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778
Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000
Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000
Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769
China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094
Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500
Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167
Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.000000
France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200
Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333
Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714
Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226
Hungary	2.382500	1.687500	0.695000	0.055000	0.220000	0.075000
India	2.718000	1.474000	1.182400	0.052000	0.644000	0.184800
Indonesia	3.265000	1.345000	1.925000	0.030000	1.015000	0.075000
Ireland	3.080000	2.024000	1.044000	0.100000	0.448000	0.148000
Israel	2.150000	1.210000	0.930000	0.090000	0.470000	0.190000
Italy	2.634868	1.678465	0.930000	0.090000	0.358465	0.176316
Jamaica	2.580000	1.350000	1.200000	0.037323	0.670000	0.170310
Japan	2.291071	1.596071	0.636786	0.069286	0.279643	0.110357
Jersey	2.957500	1.933750	1.016250	0.042500	0.577500	0.257500
Latvia	2.350000	1.200000	1.150000	0.000000	0.350000	0.200000
Lebanon	3.223333	2.590000	0.616667	0.156667	0.173333	0.073333
Luxembourg	2.420000	1.800000	0.630000	0.000000	0.290000	0.080000
Malaysia	2.945000	1.515000	1.335000	0.210000	0.525000	0.060000
Martinique	2.970000	1.340000	1.630000	0.150000	0.890000	0.070000
Mexico	2.617414	1.745690	0.846034	0.087069	0.329655	0.134828
Morocco	2.416364	1.610000	0.776818	0.010909	0.361818	0.148636
Netherlands	2.738571	1.794286	0.925714	0.058571	0.427143	0.155000
Norway	3.230000	1.510000	1.720000	0.000000	0.690000	0.140000
Palestine	3.090000	2.300000	0.790000	0.050000	0.370000	0.050000
Peru	2.462000	1.260000	1.194000	0.026000	0.480000	0.158000
Poland	2.607500	1.732500	0.840000	0.060000	0.370000	0.150000
Portugal	3.133333	2.103333	1.015000	0.030000	0.345000	0.286667
Russian Federation	2.674000	1.790000	0.846000	0.036000	0.298000	0.108000
Singapore	3.565000	2.485000	1.085000	0.000000	0.615000	0.060000
Spain	2.604250	1.636500	0.931000	0.099750	0.406000	0.163000
Sweden	2.962857	1.934286	1.000000	0.190000	0.384286	0.140000
Switzerland	3.032308	1.784615	1.144615	0.147692	0.468462	0.145385
Syria	3.570000	2.570000	1.000000	0.140000	0.290000	0.290000
Thailand	2.557143	1.511429	0.922857	0.057143	0.372857	0.048571
Turkey	2.328333	1.535000	0.793333	0.130000	0.420000	0.125000
	2.32000	1.555500	3.,00000	3.10000	5.120000	0.120000

United Kingdom 3.079412 1.823529 1.206471 0.077647 0.408824 0.241765 Vietnam 2.860000 1.853333 0.926667 0.068333 0.368333 0.120000

## 4.1.4 Compare negative emotions for each country

```
[63]: plt.rcParams["figure.figsize"] = (5,13) groupby_coun_mean_df_1[['anx','anger','sad']].plot.barh()
```

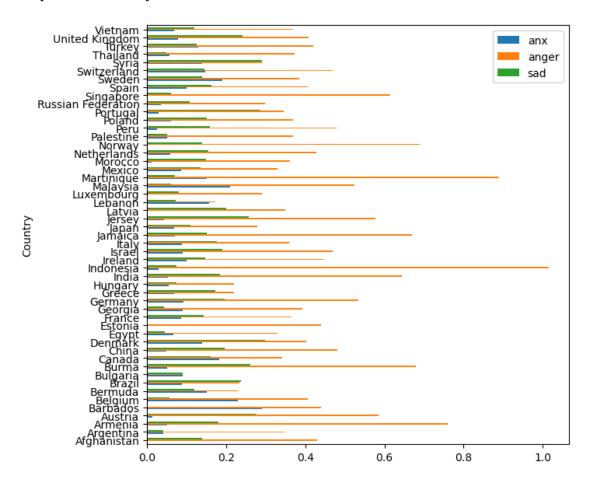
[63]: <Axes: ylabel='Country'>



### 4.1.5 Compare negative emotions for each continent

```
[64]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_1[['anx','anger','sad']].plot.barh()
```

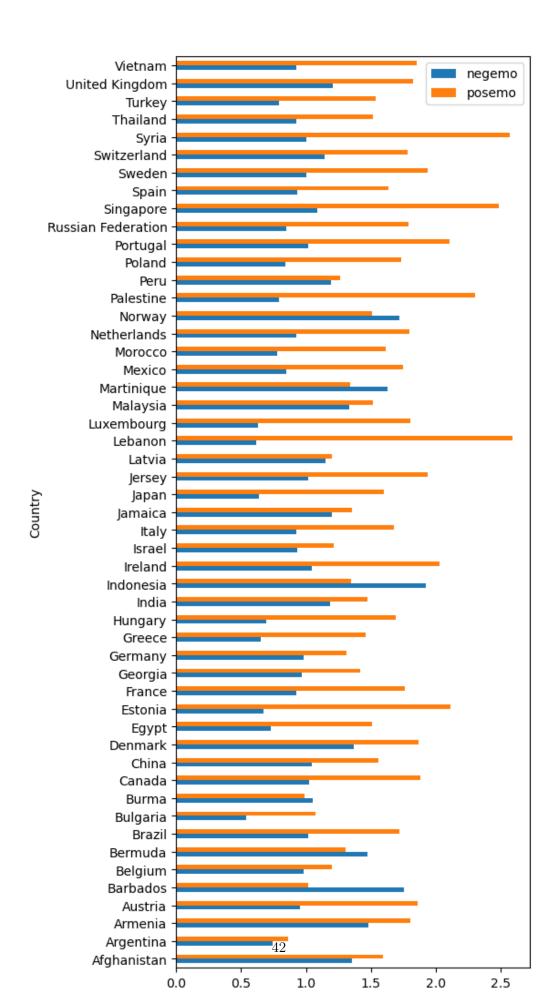
[64]: <Axes: ylabel='Country'>



#### 4.1.6 Compare positive end negative emotions in each country

```
[65]: plt.rcParams["figure.figsize"] = (5,13) groupby_coun_mean_df_1[['negemo','posemo']].plot.barh()
```

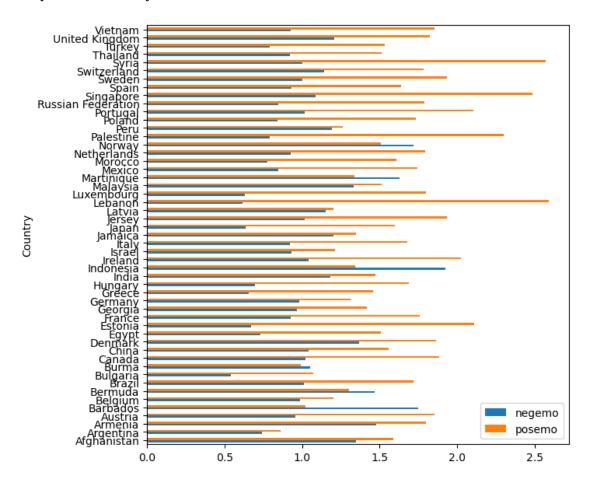
[65]: <Axes: ylabel='Country'>



### 4.1.7 Compare positive end negative emotions in each continent

```
[66]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_1[['negemo','posemo']].plot.barh()
```

[66]: <Axes: ylabel='Country'>



#### 4.2 Era 2: 1990 - 1999

```
[67]: df2_liwc = pd.read_csv('./era2_LIWC2015.csv')
df2_liwc = df2_liwc.drop("Source (A)",axis=1)

df2_liwc.insert(1,"Country","")
df2_liwc.insert(2,"Continent","")

df2_liwc["Country"] = df_2["Country"]
```

```
df2_liwc["Continent"] = df_2["Continent"]
df2_liwc = df2_liwc[df2_liwc['Country'] != "United States of America"]
df2_liwc
```

```
[67]:
                                                     Source (B)
                                                                 Country Continent
            LEAD: VIRGIL THOMSON used to say that when you...
                                                                  France
                                                                            Europe
      1
            LEAD: THE late Alfredo Viazzi had for years a ...
                                                                   Italy
                                                                            Europe
      2
            LEAD: THE late Alfredo Viazzi had for years a ...
                                                                            Europe
                                                                   Italy
      4
            LEAD: MOST home cooks shy away from curry for ...
      5
            LEAD: EVEN those who cook fairly often in the ...
                                                                   Spain
                                                                            Europe
                                                                     . . .
                                                                                . . .
      1722 ASSUMING the planning for Thanksgiving is alre...
           SCALLOPS have so many virtues -- they're tende...
            IT'S a simple almond cake, leavened by egg whi...
      1725
                                                                  France
                                                                            Europe
      1726 CHESTNUTS are challenging. Unlike walnuts, pec...
      1727 SOMETIMES recipes say more about a place and t...
                                                                 Georgia
                                                                              Asia
                                                  Source (C) \
      0
                              COOKING AND COOKBOOKS; RECIPES
      1
                              COOKING AND COOKBOOKS; RECIPES
      2
                              COOKING AND COOKBOOKS; RECIPES
      4
                              COOKING AND COOKBOOKS; RECIPES
            COOKING AND COOKBOOKS; MICROWAVE OVENS; RECIPES
      5
      1722
                                       Cooking and Cookbooks
      1723
                                                          NaN
      1725
                                  Recipes; Cooking; Desserts
      1726
                                                          NaN
      1727
                                                          NaN
                                                     Source (D)
      0
            FOOD; Having Company? You Can Still Serve a Roast
      1
                    FOOD; Autumn Game With a Touch of Tuscany
      2
                    FOOD; Autumn Game With a Touch of Tuscany
                                             60-MINUTE GOURMET
      4
      5
                                             MICROWAVE COOKING
      1722
            Thanksgiving Cobblers That Are Easy as Pie but...
      1723
                                         Scallops, Plus Crunch
      1725
                         The Pastry Chef's Rich Little Secret
      1726
                          The Chestnut Comes Out of Its Shell
      1727
            Recipes of the South That Speak for the People...
                                                     Source (E)
                                                                 Source (F)
      0
            New York Times, Late Edition (East Coast); New...
                                                                     1990.0
      1
            New York Times, Late Edition (East Coast); New...
                                                                     1990.0
```

```
2
      New York Times, Late Edition (East Coast); New...
                                                                   1990.0
4
      New York Times, Late Edition (East Coast); New...
                                                                    1990.0
5
      New York Times, Late Edition (East Coast); New...
                                                                   1990.0
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1722 New York Times, Late Edition (East Coast); New...
                                                                   1999.0
1723
      New York Times, Late Edition (East Coast); New...
                                                                   1999.0
      New York Times, Late Edition (East Coast); New...
1725
                                                                   1999.0
1726 New York Times, Late Edition (East Coast); New...
                                                                   1999.0
      New York Times, Late Edition (East Coast); New...
1727
                                                                   1999.0
           Source (G)
                          WC
                               Analytic
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                                               Comma
                                                       Colon
                                                               SemiC
                                                                       QMark
                                                                              Exclam \
0
      New York, N.Y.
                                  97.70
                                                3.73
                                                        1.05
                                                                0.00
                                                                        0.00
                                                                                  0.0
                        1045
                                          . . .
1
      New York, N.Y.
                        1308
                                  97.68
                                                4.89
                                                        0.92
                                                                0.15
                                                                        0.00
                                                                                  0.0
                                          . . .
2
      New York, N.Y.
                        1308
                                  97.68
                                                4.89
                                                        0.92
                                                                0.15
                                                                        0.00
                                                                                  0.0
4
      New York, N.Y.
                         676
                                  95.89
                                                6.51
                                                        0.74
                                                                0.00
                                                                        0.00
                                                                                  0.0
                                          . . .
5
      New York, N.Y.
                        1692
                                  97.17
                                                5.73
                                                        0.89
                                                                0.06
                                                                        0.00
                                                                                  0.0
. . .
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      New York, N.Y.
                                  95.41
                                                6.08
                                                                        0.00
                                                                                  0.0
1722
                         707
                                          . . .
                                                        0.85
                                                                0.00
1723 New York, N.Y.
                         382
                                  80.00
                                                8.38
                                                        0.79
                                                                0.26
                                                                        0.00
                                                                                  0.0
                                          . . .
1725
      New York, N.Y.
                                  94.64
                                                6.83
                                                        0.47
                                                                        0.00
                                                                                  0.0
                        1289
                                                                0.08
                                          . . .
                                  93.99
1726
      New York, N.Y.
                        1229
                                          . . .
                                                7.97
                                                        0.73
                                                                0.08
                                                                        0.00
                                                                                  0.0
1727
      New York, N.Y.
                                  94.00
                                                6.93
                                                        0.24
                                                                0.24
                                                                                  0.0
                         851
                                                                        0.12
                                          . . .
      Dash
             Quote
                    Apostro
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0
      1.24
               0.0
                        0.10
                                  0.77
                                           0.10
1
      0.61
               0.0
                        2.06
                                  0.76
                                           0.76
      0.61
               0.0
                        2.06
                                  0.76
                                           0.76
4
      0.30
               0.0
                        0.00
                                  0.00
                                           1.18
5
      2.13
               0.0
                        0.30
                                  1.77
                                           0.83
        . . .
               . . .
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                                            . . .
1722 3.11
               0.0
                        0.00
                                  0.57
                                           1.84
                                           0.79
1723 1.57
                        0.52
                                  1.57
               0.0
1725
      1.24
               0.0
                        2.72
                                  0.62
                                           0.39
1726
      1.30
               0.0
                        0.98
                                  0.81
                                           1.22
1727
      0.94
                        6.93
                                  0.71
                                           0.24
               0.0
```

[1598 rows x 101 columns]

# 4.2.1 Use groupby function to produce the mean value in each quantitative column for each country

```
[68]: groupby_coun_mean_df_2 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_coun_mean_df_2 = groupby_coun_mean_df_2.drop(groupby_coun_mean_df_2.

→index[0])
groupby_coun_mean_df_2 = groupby_coun_mean_df_2.drop("Source (F)",axis=1)
groupby_coun_mean_df_2
```

[68]:		WC	Analytic	Clout	Authentic	Tone	\
	Country		-				
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	
	Bermuda	541.000000	90.295000	48.145000	24.885000	23.545000	
	Brazil	1744.666667	95.586667	47.893333	18.612222	38.496667	
	Bulgaria	1118.000000	96.450000	42.540000	9.800000	35.120000	
	Burma	1912.000000	94.640000	63.310000	20.990000	24.930000	
	Canada	1059.692308	95.527692	48.241538	19.528462	41.510000	
	China	1402.625000	95.066641	48.824375	18.128047	35.558750	
	Denmark	947.500000	89.425000	54.180000	10.857500	34.347500	
	Egypt	1174.250000	97.278333	55.270833	23.430833	39.959167	
	Estonia	899.000000	97.170000	60.540000	25.940000	52.920000	
	France	1526.578462	96.130708	50.012646	17.612769	41.174892	
	Georgia	2040.666667	98.043333	51.456667	18.253333	34.220000	
	Germany	1404.285714	94.748571	53.110000	15.520000	32.054286	
	Greece	1025.709677	95.969677	45.147742	15.301613	40.556452	
	Hungary	1649.250000	96.645000	46.395000	14.622500	44.110000	
	India	1725.800000	94.903600	52.015600	17.686000	31.194000	
	Indonesia	1516.500000	95.740000	46.640000	7.640000	18.345000	
	Ireland	1994.000000	89.526000	56.042000	19.410000	43.746000	
	Israel	2143.000000	87.490000	51.870000	17.530000	30.500000	
	Italy	1384.706140	95.111140	49.084649	17.567368	39.806184	
	Jamaica	2673.000000	95.940000	51.050000	17.590000	28.260000	
	Japan	1699.535714	95.610357	50.469643	18.332143	43.664643	
	Jersey	1614.125000	95.925000	47.405000	18.570000	42.515000	
	Latvia	1996.000000	97.610000	59.700000	11.290000	26.600000	
	Lebanon	1979.333333	95.763333	59.640000	14.326667	62.370000	
	Luxembourg	2394.000000		51.840000	21.620000	47.390000	
	Malaysia	1934.500000	94.100000	48.880000	14.080000	29.370000 21.220000	
	Martinique Mexico	1348.000000 1447.896552	92.170000 95.712069	42.640000 49.854483	5.820000 17.680690		
	Morocco	1166.954545	95.712069	49.034463	18.417273	42.423793 41.380909	
	Netherlands	1650.142857	94.834286	54.525000	13.259286	41.741429	
	Norway	1453.000000	95.360000	48.900000	11.630000	22.570000	
	Palestine	1909.000000	95.720000	64.710000	12.660000	54.370000	
	Peru	978.000000	96.814000	48.882000	8.342000	27.174000	
	Poland	1450.750000	91.037500	45.872500	14.687500	42.110000	
	Portugal	1766.666667	91.037300	54.671667	17.136667	46.013333	
	Russian Federation	1465.200000	95.214000	49.008000	12.566000	43.070000	
	Singapore	1710.000000	95.510000	57.875000	14.825000	52.060000	
	Spain	1180.925000	95.416250	48.128000	19.387250	38.898750	
	Sweden	2310.142857	95.510000	48.870000	15.304286	42.837143	
	2404011	2010.112001	55.51000	10.07000	10.00 1200	12.001140	

Switze	rland	2088.46153					
Syria	_	700.00000					
Thaila		1892.85714					
Turkey		966.83333					
	Kingdom	1443.64705					
Vietna	m	2016.16666	7 95.03333	33 55.10000	0 16.22500	0 42.9816	67
							,
_		WPS	Sixltr	Dic	function	pronoun	\
Countr	•						• • •
Afghan		12.440000	18.000000	68.910000	34.840000	4.760000	• • •
Argent		14.030000	18.970000	63.460000	34.980000	2.690000	• • •
Armeni		14.680000	18.500000	71.060000	38.240000	3.720000	• • •
Austri		14.876667	19.186667	69.585000	37.369167	4.441667	• • •
Barbad		11.420000	20.290000	71.390000	37.960000	5.840000	• • •
Belgiu		15.167143	21.214286	63.952857	33.472857	2.134286	• • •
Bermud		11.070000	14.635000	71.800000	41.750000	6.170000	• • •
Brazil		14.442222	19.094444	67.278889	38.577778	3.870000	• • •
Bulgar	ia	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma		17.700000	18.360000	66.740000	36.040000	4.500000	• • •
Canada		14.713077	17.750769	68.160769	38.068462	3.740000	• • •
China		14.150937	19.131484	66.323203	36.076797	3.350234	• • •
Denmar	k	12.790000	17.910000	73.430000	40.722500	6.890000	• • •
Egypt		13.406667	19.245000	69.165833	36.812500	2.771667	• • •
Estoni		18.350000	22.910000	69.190000	37.820000	4.340000	
France		14.303323	18.144246	68.253969	38.043754	3.987077	
Georgi	a	15.933333	19.453333	64.723333	35.946667	2.813333	
German	у	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece		14.264839	18.810968	64.129355	35.644839	2.827097	
Hungar	У	13.915000	19.265000	64.307500	33.332500	1.610000	
India		15.218800	18.877600	67.590000	36.448000	4.284800	
Indone	sia	11.835000	18.295000	61.005000	31.665000	2.320000	
Irelan	d	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel		15.420000	18.760000	67.570000	37.840000	4.810000	
Italy		14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaic	a	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan		14.178571	19.909286	65.258571	36.512857	3.327143	
Jersey		16.186250	20.435000	65.820000	35.992500	2.697500	
Latvia		13.770000	17.030000	70.940000	39.280000	4.610000	
Lebano	n	17.886667	19.320000	69.653333	38.993333	4.616667	
Luxemb	ourg	18.420000	15.080000	67.540000	37.760000	2.550000	
Malays	ia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martin	ique	15.860000	17.580000	61.200000	32.640000	2.970000	
Mexico		14.475517	19.086724	66.820172	37.476552	4.035690	
Morocc	0	15.092727	19.106364	67.562273	39.191364	4.010000	
Nether	lands	15.422143	19.239286	66.140714	36.776429	4.399286	
Norway		18.390000	18.860000	66.690000	36.340000	2.960000	
Palest	ine	19.680000	22.470000	68.100000	38.340000	5.190000	

Peru	12.648000	17.694000	0 64.69400	00 35.894	000 2.342000	
Poland	15.837500	17.127500	0 69.51000	00 37.850	000 5.610000	
Portugal	13.598333	19.120000	70.51166	39.573	333 6.020000	
Russian Federation	12.856000	18.190000	0 65.36200	00 35.560	000 3.202000	
Singapore	16.845000	19.620000	71.40500	00 37.830	000 3.595000	
Spain	14.534250	18.534500	0 68.58650	00 38.346	250 3.595000	
Sweden	13.571429	19.244286				
Switzerland	14.965385	18.97307				
Syria	14.580000	21.430000				
Thailand	15.767143	19.845714				
Turkey	13.855000	19.630000				
•						• •
United Kingdom	13.719412					
Vietnam	15.136667	19.06666	7 67.59000	00 37.188	333 4.503333	
	Comma	Colon	SemiC	QMark	Exclam \	
Country						
Afghanistan	7.600000	0.290000	0.140000	0.000000	0.000000	
Argentina	6.660000	0.700000	0.190000	0.000000	0.000000	
Armenia	6.210000	0.300000	0.050000	0.000000	0.000000	
Austria	5.333333	0.831667	0.085000	0.071667	0.000000	
Barbados	5.840000	0.290000	0.150000	0.000000	0.000000	
Belgium	5.490000	0.390000	0.255714	0.000000	0.000000	
Bermuda	4.840000	0.505000	0.235000	0.305000	0.000000	
Brazil	6.341111	0.320000	0.076667	0.032222	0.011111	
Bulgaria	5.460000	0.540000	0.090000	0.000000	0.000000	
Burma	6.540000	1.150000	0.210000	0.000000	0.050000	
Canada	4.960769	0.364615	0.065385	0.000000	0.000000	
China	5.492500	0.581406	0.168281	0.035469	0.002812	
Denmark _	6.440000	0.605000	0.015000	0.132500	0.000000	
Egypt	5.274167	0.928333	0.063333	0.011667	0.00000	
Estonia	5.780000	0.330000	0.110000	0.110000	0.000000	
France	5.226800	0.526092	0.117200	0.035785	0.004154	
Georgia	5.560000	0.356667	0.086667	0.013333	0.016667	
Germany	4.552857	0.454286	0.184286	0.085714	0.000000	
Greece	5.346129	0.605161	0.123871	0.000000	0.000000	
Hungary	4.495000	0.487500	0.235000	0.00000	0.00000	
India	6.070800	0.469200	0.136800	0.014400	0.006000	
Indonesia	6.570000	0.375000	0.180000	0.000000	0.000000	
Ireland	5.504000	0.800000	0.210000	0.332000	0.000000	
Israel	6.350000	0.470000	0.050000	0.000000	0.000000	
Italy	5.460132	0.601667	0.125175	0.030044	0.004868	
Jamaica	8.190000	0.340000	0.040000	0.000000	0.000000	
Japan	5.297500	0.683214	0.130000	0.017500	0.004643	
Jersey	7.520000	0.372500	0.068750	0.018750	0.000000	
Latvia	7.520000	0.350000	0.100000	0.000000	0.000000	
Lebanon	6.520000	0.356667	0.273333	0.000000	0.026667	
Luxembourg	5.680000	0.330000	0.080000	0.000000	0.000000	

Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
	Dash	Quote	Apostro	Parenth	OtherP
Country					
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
Georgia	0.943333	0.000000	1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000

```
Italy
                   1.134518
                             0.004561
                                       1.355307
                                                 0.780746 1.277851
Jamaica
                   1.270000
                             0.000000
                                       1.420000
                                                 1.720000
                                                           2.920000
Japan
                   1.207857
                             0.000000
                                       1.271429
                                                 0.810000 1.641071
Jersey
                   0.841250
                             0.000000
                                       1.142500
                                                 1.323750
                                                           3.186250
Latvia
                             0.000000
                                       5.760000
                                                 0.200000 2.710000
                   1.500000
Lebanon
                   1.040000
                             0.000000
                                       1.510000
                                                 0.690000 1.386667
Luxembourg
                             0.000000
                                       2.300000
                   2.800000
                                                 0.630000 1.040000
Malaysia
                   1.375000
                             0.000000
                                       1.440000
                                                 0.530000 4.075000
Martinique
                   1.410000
                             0.000000
                                       0.300000
                                                 0.590000 6.080000
Mexico
                                       1.297759
                   1.539828
                             0.001552
                                                 0.895690 1.517241
Morocco
                   0.961364
                             0.000000
                                       0.535455
                                                 0.841364 1.594545
Netherlands
                   1.603571
                             0.000000
                                       2.865000
                                                 0.672857 1.208571
Norway
                   0.760000
                             0.000000
                                       0.140000
                                                 2.060000 1.650000
Palestine
                   1.520000
                             0.000000
                                       3.820000
                                                 0.840000 0.470000
Peru
                   1.168000
                             0.000000
                                       0.572000
                                                 0.368000
                                                          0.656000
Poland
                   1.010000
                             0.000000
                                       2.065000
                                                 0.880000 0.865000
Portugal
                   1.391667
                             0.028333
                                       4.128333
                                                 0.825000 1.115000
Russian Federation
                                       1.440000
                   1.280000
                             0.000000
                                                 1.126000 1.060000
Singapore
                   1.110000
                             0.000000
                                       2.310000
                                                 0.235000
                                                           0.760000
Spain
                   1.196750
                             0.002000
                                       1.062000
                                                 0.897000 1.733500
Sweden
                   1.035714
                             0.004286
                                       2.001429
                                                 1.207143 1.084286
                                       1.330769
                             0.003846
                                                 0.756923 1.960769
Switzerland
                   1.075385
                             0.000000
                                       3.000000
                                                 0.860000 0.430000
Syria
                   2.570000
Thailand
                   1.134286
                             0.000000
                                       2.298571
                                                 1.081429 1.437143
Turkey
                                       1.600000
                                                 0.430000 0.946667
                   1.031667
                             0.000000
United Kingdom
                   0.970000
                             0.000000
                                       1.460000
                                                 0.935294 1.944118
Vietnam
                   1.126667
                             0.000000
                                       2.645000
                                                 1.141667
                                                           1.460000
```

[51 rows x 93 columns]

# 4.2.2 Use groupby function to produce the mean value in each quantitative column for each continent

```
[69]: groupby_con_mean_df_2 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_con_mean_df_2 = groupby_con_mean_df_2.drop(groupby_con_mean_df_2.

→index[0])
groupby_con_mean_df_2 = groupby_con_mean_df_2.drop("Source (F)",axis=1)
groupby_con_mean_df_2
```

```
[69]:
                                  WC
                                       Analytic
                                                     Clout Authentic
                                                                            Tone \
      Country
                         2078.000000
      Afghanistan
                                      94.380000
                                                 58.740000 18.370000
                                                                       29.800000
      Argentina
                         2567.000000
                                      98.110000
                                                 52.030000 14.780000
                                                                       27.710000
      Armenia
                         4330.000000
                                      93.470000
                                                 43.940000 24.620000
                                                                       31.270000
      Austria
                         1194.083333
                                      95.870000
                                                 56.314167
                                                            14.162500
                                                                       42.167500
      Barbados
                          685.000000
                                      88.370000
                                                 36.290000
                                                            25.670000
                                                                       15.500000
      Belgium
                          833.142857
                                      97.494286
                                                 47.518571
                                                            20.001429
                                                                       31.001429
```

```
Bermuda
                      541.000000
                                  90.295000
                                              48.145000
                                                         24.885000
                                                                     23.545000
Brazil
                     1744.666667
                                  95.586667
                                              47.893333
                                                         18.612222
                                                                     38.496667
Bulgaria
                     1118.000000
                                  96.450000
                                              42.540000
                                                          9.800000
                                                                     35.120000
Burma
                     1912.000000
                                  94.640000
                                              63.310000
                                                         20.990000
                                                                     24.930000
Canada
                                  95.527692
                     1059.692308
                                              48.241538
                                                         19.528462
                                                                     41.510000
China
                     1402.625000
                                  95.066641
                                              48.824375
                                                         18.128047
                                                                     35.558750
Denmark
                      947.500000
                                  89.425000
                                              54.180000
                                                         10.857500
                                                                     34.347500
Egypt
                     1174.250000
                                  97.278333
                                              55.270833
                                                         23.430833
                                                                     39.959167
Estonia
                      899.000000
                                  97.170000
                                              60.540000
                                                         25.940000
                                                                     52.920000
France
                                  96.130708
                     1526.578462
                                              50.012646
                                                         17.612769
                                                                     41.174892
Georgia
                     2040.666667
                                  98.043333
                                              51.456667
                                                         18.253333
                                                                     34.220000
Germany
                     1404.285714
                                  94.748571
                                              53.110000
                                                         15.520000
                                                                     32.054286
Greece
                     1025.709677
                                  95.969677
                                              45.147742
                                                         15.301613
                                                                     40.556452
Hungary
                     1649.250000
                                  96.645000
                                              46.395000
                                                         14.622500
                                                                     44.110000
India
                     1725.800000
                                  94.903600
                                              52.015600
                                                         17.686000
                                                                     31.194000
Indonesia
                     1516.500000
                                  95.740000
                                              46.640000
                                                          7.640000
                                                                     18.345000
Ireland
                     1994.000000
                                  89.526000
                                              56.042000
                                                                     43.746000
                                                         19.410000
Israel
                     2143.000000
                                  87.490000
                                              51.870000
                                                         17.530000
                                                                     30.500000
Italy
                     1384.706140
                                  95.111140
                                              49.084649
                                                         17.567368
                                                                     39.806184
Jamaica
                                  95.940000
                                              51.050000
                     2673.000000
                                                         17.590000
                                                                     28.260000
Japan
                     1699.535714
                                  95.610357
                                              50.469643
                                                         18.332143
                                                                     43.664643
                                              47.405000
Jersey
                     1614.125000
                                  95.925000
                                                         18.570000
                                                                     42.515000
Latvia
                                  97.610000
                                              59.700000
                                                         11.290000
                                                                     26.600000
                     1996.000000
Lebanon
                     1979.333333
                                  95.763333
                                              59.640000
                                                         14.326667
                                                                     62.370000
Luxembourg
                                  97.740000
                                              51.840000
                                                                     47.390000
                     2394.000000
                                                         21.620000
Malaysia
                     1934.500000
                                  94.100000
                                              48.880000
                                                         14.080000
                                                                     29.370000
                                              42.640000
Martinique
                     1348.000000
                                  92.170000
                                                          5.820000
                                                                     21.220000
Mexico
                     1447.896552
                                  95.712069
                                              49.854483
                                                         17.680690
                                                                     42.423793
Morocco
                     1166.954545
                                  95.141818
                                              49.725455
                                                         18.417273
                                                                     41.380909
                                              54.525000
Netherlands
                     1650.142857
                                  94.834286
                                                         13.259286
                                                                     41.741429
                                  95.360000
                                              48.900000
Norway
                     1453.000000
                                                         11.630000
                                                                     22.570000
Palestine
                     1909.000000
                                  95.720000
                                              64.710000
                                                         12.660000
                                                                     54.370000
Peru
                      978.000000
                                  96.814000
                                              48.882000
                                                          8.342000
                                                                     27.174000
Poland
                     1450.750000
                                  91.037500
                                              45.872500
                                                         14.687500
                                                                     42.110000
                                  91.348333
                                                                     46.013333
Portugal
                     1766.666667
                                              54.671667
                                                         17.136667
Russian Federation
                    1465.200000
                                  95.214000
                                              49.008000
                                                         12.566000
                                                                     43.070000
                                                                     52.060000
                                              57.875000
Singapore
                     1710.000000
                                  95.510000
                                                         14.825000
Spain
                                  95.416250
                                              48.128000
                                                         19.387250
                     1180.925000
                                                                     38.898750
Sweden
                     2310.142857
                                  95.510000
                                              48.870000
                                                         15.304286
                                                                     42.837143
Switzerland
                     2088.461538
                                  95.963077
                                              48.576154
                                                         13.411538
                                                                     37.230769
Syria
                      700.000000
                                  97.730000
                                              56.250000
                                                         27.590000
                                                                     55.390000
Thailand
                     1892.857143
                                  95.334286
                                              52.005714
                                                         16.937143
                                                                     36.967143
Turkey
                                              50.925000
                      966.833333
                                  95.601667
                                                         11.990000
                                                                     39.153333
United Kingdom
                     1443.647059
                                  97.135294
                                              48.982353
                                                         24.242353
                                                                     37.231765
Vietnam
                                  95.033333
                                              55.100000
                                                         16.225000
                     2016.166667
                                                                     42.981667
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Dic

function

pronoun

Sixltr

WPS

Country						
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	• • •
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	• • •
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	• • •
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	• • •
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	• • •
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	• • •
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	• • •
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	• • •
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	• • •
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	• • •
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	• • •
Peru	12.648000	17.694000	64.694000	35.894000	2.342000	• • •
Poland	15.837500	17.127500	69.510000	37.850000	5.610000	• • •
Portugal	13.598333	19.120000	70.511667	39.573333	6.020000	• • •
Russian Federation	12.856000	18.190000	65.362000	35.560000	3.202000	• • •
Singapore	16.845000	19.620000	71.405000	37.830000	3.595000	• • •
Spain	14.534250	18.534500	68.586500	38.346250	3.595000	• • •
Sweden	13.571429	19.244286	65.941429	34.744286	3.494286	• • •
Switzerland	14.965385	18.973077	67.793846	37.250769	3.877692	• • •

Syria	14.580000	21.430000	72.8600	00 38.710	3.290000	٠
Thailand	15.767143	19.845714	67.1057	14 36.8028	357 4.047143	
Turkey	13.855000	19.630000	65.3500	00 36.353	333 3.866667	• • •
United Kingdom	13.719412	17.574118	68.7576	47 38.4076	647 4.081765	
Vietnam	15.136667	19.066667	67.5900	00 37.1883	333 4.503333	
	Comma	Colon	SemiC	QMark	Exclam \	
Country						
Afghanistan	7.600000		0.140000	0.000000	0.000000	
Argentina	6.660000		0.190000	0.000000	0.000000	
Armenia	6.210000		0.050000	0.000000	0.00000	
Austria	5.333333		0.085000	0.071667	0.00000	
Barbados	5.840000	0.290000	0.150000	0.000000	0.000000	
Belgium	5.490000		0.255714	0.000000	0.000000	
Bermuda	4.840000		0.235000	0.305000	0.000000	
Brazil	6.341111		0.076667	0.032222	0.011111	
Bulgaria	5.460000		0.090000	0.000000	0.000000	
Burma	6.540000		0.210000	0.000000	0.050000	
Canada	4.960769		0.065385	0.000000	0.000000	
China	5.492500		0.168281	0.035469	0.002812	
Denmark	6.440000	0.605000	0.015000	0.132500	0.000000	
Egypt	5.274167	0.928333	0.063333	0.011667	0.000000	
Estonia	5.780000	0.330000	0.110000	0.110000	0.000000	
France	5.226800	0.526092	0.117200	0.035785	0.004154	
Georgia	5.560000	0.356667	0.086667	0.013333	0.016667	
Germany	4.552857	0.454286	0.184286	0.085714	0.000000	
Greece	5.346129		0.123871	0.000000	0.000000	
Hungary	4.495000	0.487500	0.235000	0.000000	0.000000	
India	6.070800	0.469200	0.136800	0.014400	0.006000	
Indonesia	6.570000	0.375000	0.180000	0.000000	0.000000	
Ireland	5.504000	0.800000	0.210000	0.332000	0.000000	
Israel	6.350000	0.470000	0.050000	0.000000	0.000000	
Italy	5.460132	0.601667	0.125175	0.030044	0.004868	
Jamaica	8.190000	0.340000	0.040000	0.000000	0.000000	
Japan	5.297500	0.683214	0.130000	0.017500	0.004643	
Jersey	7.520000	0.372500	0.068750	0.018750	0.000000	
Latvia	7.520000	0.350000	0.100000	0.000000	0.000000	
Lebanon	6.520000	0.356667	0.273333	0.000000	0.026667	
Luxembourg	5.680000	0.330000	0.080000	0.000000	0.000000	
Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000	
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000	
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690	
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000	
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000	
Norway	5.640000	0.960000	0.210000	0.000000	0.000000	
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000	
Peru	5.628000	0.550000	0.026000	0.000000	0.00000	

<b>D</b> .					
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
7 - 0 0 - 1 - 1 - 1	0.00000				0.02000
	Dash	0110+0	Anogtro	Daran+h	OtherP
Country	Dasii	Quote	Apostro	Parenth	Otherr
Country	0 670000	0 000000	2 000000	1 050000	2 000000
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
		0.004092			
Georgia	0.943333		1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000
Italy	1.134518	0.004561	1.355307	0.780746	1.277851
Jamaica	1.270000	0.000000	1.420000	1.720000	2.920000
Japan	1.207857	0.000000	1.271429	0.810000	1.641071
Jersey	0.841250	0.000000	1.142500	1.323750	3.186250
Latvia	1.500000	0.000000	5.760000	0.200000	2.710000
Lebanon	1.040000	0.000000	1.510000	0.690000	1.386667
Luxembourg	2.800000	0.000000	2.300000	0.630000	1.040000
Malaysia	1.375000	0.000000	1.440000	0.530000	4.075000
патауыта	1.0/0000	0.00000	1.440000	0.00000	±.010000

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Martinique
                    1.410000
                             0.000000
                                       0.300000
                                                 0.590000
                                                           6.080000
Mexico
                    1.539828
                             0.001552
                                       1.297759
                                                 0.895690
                                                           1.517241
Morocco
                    0.961364
                             0.000000
                                       0.535455
                                                 0.841364 1.594545
Netherlands
                    1.603571
                             0.000000
                                        2.865000
                                                 0.672857
                                                           1.208571
                             0.000000
                                       0.140000
                                                 2.060000 1.650000
Norway
                    0.760000
Palestine
                    1.520000
                             0.000000
                                       3.820000
                                                 0.840000
                                                           0.470000
Peru
                             0.000000
                    1.168000
                                       0.572000
                                                 0.368000
                                                           0.656000
                                                           0.865000
Poland
                    1.010000
                             0.000000
                                       2.065000
                                                 0.880000
Portugal
                    1.391667
                             0.028333
                                       4.128333
                                                 0.825000
                                                           1.115000
Russian Federation
                                       1.440000
                   1.280000
                             0.000000
                                                 1.126000
                                                           1.060000
Singapore
                    1.110000
                             0.000000
                                       2.310000
                                                 0.235000
                                                           0.760000
Spain
                    1.196750
                             0.002000
                                       1.062000
                                                 0.897000
                                                           1.733500
Sweden
                    1.035714
                             0.004286
                                       2.001429
                                                 1.207143 1.084286
Switzerland
                    1.075385
                             0.003846
                                       1.330769
                                                 0.756923 1.960769
Syria
                    2.570000
                             0.000000
                                       3.000000
                                                 0.860000 0.430000
Thailand
                    1.134286
                             0.000000
                                       2.298571
                                                 1.081429
                                                           1.437143
Turkey
                              0.000000
                                       1.600000
                                                 0.430000
                                                           0.946667
                    1.031667
United Kingdom
                                        1.460000
                    0.970000
                             0.000000
                                                 0.935294
                                                           1.944118
Vietnam
                    1.126667
                             0.000000
                                        2.645000
                                                 1.141667
                                                           1.460000
```

[51 rows x 93 columns]

#### 4.2.3 Show only the columns of "Affective processes" and its sub-codes

[70]:	groupby_coun_mean_df_2[['affect','posemo', 'negemo', 'anx', 'anger', 'sad']]									
[70]:		affect	posemo	negemo	anx	anger	sad			
	Country									
	Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000			
	Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000			
	Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000			
	Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167			
	Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.00000			
	Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143			
	Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000			
	Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778			
	Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000			
	Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000			
	Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769			
	China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094			
	Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500			
	Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167			
	Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.00000			
	France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200			
	Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333			
	Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714			
	Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226			

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Hungary
                    2.382500
                               1.687500
                                         0.695000
                                                   0.055000
                                                             0.220000
                                                                        0.075000
India
                               1.474000
                                         1.182400
                                                   0.052000
                                                             0.644000
                                                                        0.184800
                    2.718000
Indonesia
                    3.265000
                               1.345000
                                         1.925000
                                                   0.030000
                                                              1.015000
                                                                        0.075000
Ireland
                    3.080000
                               2.024000
                                         1.044000
                                                   0.100000
                                                              0.448000
                                                                        0.148000
Israel
                                                   0.090000
                                                             0.470000
                    2.150000
                               1.210000
                                         0.930000
                                                                        0.190000
Italy
                               1.678465
                                         0.923816
                                                   0.087325
                                                              0.358465
                    2.634868
                                                                        0.176316
Jamaica
                               1.350000
                                         1.200000
                                                   0.070000
                                                             0.670000
                                                                        0.150000
                    2.580000
Japan
                    2.291071
                               1.596071
                                         0.636786
                                                   0.069286
                                                              0.279643
                                                                        0.110357
                                                                        0.257500
Jersey
                               1.933750
                                         1.016250
                                                   0.042500
                                                             0.577500
                    2.957500
Latvia
                    2.350000
                               1.200000
                                         1.150000
                                                   0.000000
                                                              0.350000
                                                                        0.200000
Lebanon
                    3.223333
                               2.590000
                                         0.616667
                                                   0.156667
                                                              0.173333
                                                                        0.073333
Luxembourg
                               1.800000
                                         0.630000
                                                   0.000000
                                                             0.290000
                    2.420000
                                                                        0.080000
Malaysia
                    2.945000
                               1.515000
                                         1.335000
                                                   0.210000
                                                             0.525000
                                                                        0.060000
Martinique
                    2.970000
                               1.340000
                                         1.630000
                                                   0.150000
                                                              0.890000
                                                                        0.070000
Mexico
                    2.617414
                               1.745690
                                         0.846034
                                                   0.087069
                                                              0.329655
                                                                        0.134828
Morocco
                    2.416364
                               1.610000
                                         0.776818
                                                   0.010909
                                                             0.361818
                                                                        0.148636
Netherlands
                                         0.925714
                                                   0.058571
                                                              0.427143
                    2.738571
                               1.794286
                                                                        0.155000
Norway
                    3.230000
                               1.510000
                                         1.720000
                                                   0.000000
                                                              0.690000
                                                                        0.140000
Palestine
                    3.090000
                               2.300000
                                         0.790000
                                                   0.050000
                                                              0.370000
                                                                        0.050000
Peru
                    2.462000
                               1.260000
                                         1.194000
                                                   0.026000
                                                             0.480000
                                                                        0.158000
Poland
                    2.607500
                               1.732500
                                         0.840000
                                                   0.060000
                                                              0.370000
                                                                        0.150000
Portugal
                    3.133333
                              2.103333
                                         1.015000
                                                   0.030000
                                                              0.345000
                                                                        0.286667
                               1.790000
                                                             0.298000
Russian Federation
                    2.674000
                                         0.846000
                                                   0.036000
                                                                        0.108000
Singapore
                    3.565000
                               2.485000
                                         1.085000
                                                   0.000000
                                                             0.615000
                                                                        0.060000
Spain
                    2.604250
                               1.636500
                                         0.931000
                                                   0.099750
                                                              0.406000
                                                                        0.163000
Sweden
                    2.962857
                               1.934286
                                         1.000000
                                                   0.190000
                                                              0.384286
                                                                        0.140000
Switzerland
                    3.032308
                               1.784615
                                         1.144615
                                                   0.147692
                                                              0.468462
                                                                        0.145385
Syria
                    3.570000
                               2.570000
                                         1.000000
                                                   0.140000
                                                              0.290000
                                                                        0.290000
Thailand
                    2.557143
                               1.511429
                                         0.922857
                                                   0.057143
                                                              0.372857
                                                                        0.048571
Turkey
                    2.328333
                               1.535000
                                         0.793333
                                                   0.130000
                                                             0.420000
                                                                        0.125000
United Kingdom
                    3.079412
                               1.823529
                                         1.206471
                                                   0.077647
                                                              0.408824
                                                                        0.241765
Vietnam
                    2.860000
                              1.853333
                                         0.926667
                                                   0.068333
                                                             0.368333
                                                                        0.120000
```

#### [71]: groupby\_con\_mean\_df\_2[['affect','posemo', 'negemo', 'anx', 'anger', 'sad']]

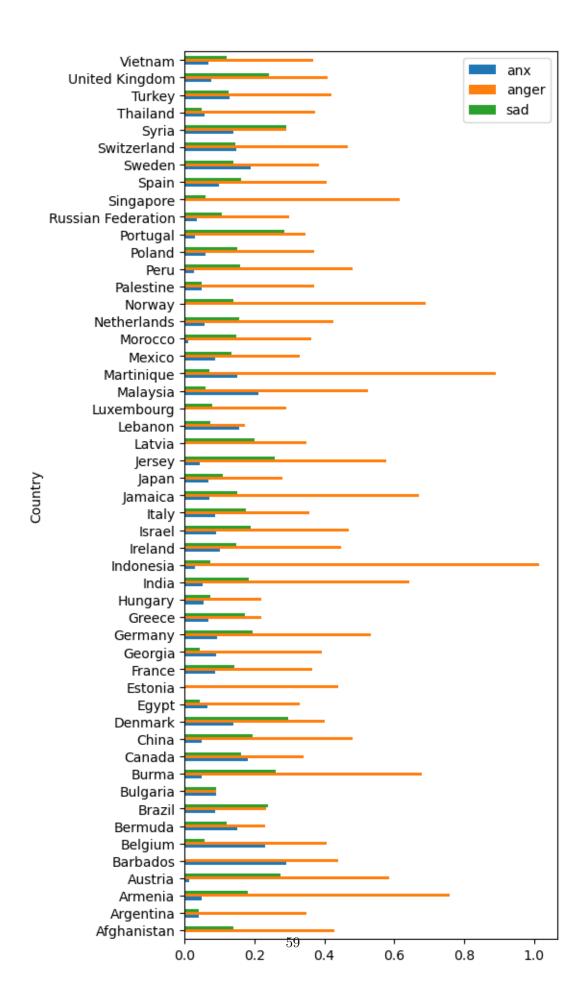
[71]:		affect	posemo	negemo	anx	anger	sad
	Country						
	Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000
	Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000
	Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000
	Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167
	Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.000000
	Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143
	Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000
	Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778
	Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000
	Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000

Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769
China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094
Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500
Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167
Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.000000
France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200
Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333
Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714
Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226
Hungary	2.382500	1.687500	0.695000	0.055000	0.220000	0.075000
India	2.718000	1.474000	1.182400	0.052000	0.644000	0.184800
Indonesia	3.265000	1.345000	1.925000	0.030000	1.015000	0.075000
Ireland	3.080000	2.024000	1.044000	0.100000	0.448000	0.148000
Israel	2.150000	1.210000	0.930000	0.090000	0.470000	0.190000
Italy	2.634868	1.678465	0.923816	0.087325	0.358465	0.176316
Jamaica	2.580000	1.350000	1.200000	0.070000	0.670000	0.150000
Japan	2.291071	1.596071	0.636786	0.069286	0.279643	0.110357
Jersey	2.957500	1.933750	1.016250	0.042500	0.577500	0.257500
Latvia	2.350000	1.200000	1.150000	0.000000	0.350000	0.200000
Lebanon	3.223333	2.590000	0.616667	0.156667	0.173333	0.073333
Luxembourg	2.420000	1.800000	0.630000	0.000000	0.290000	0.080000
Malaysia	2.945000	1.515000	1.335000	0.210000	0.525000	0.060000
Martinique	2.970000	1.340000	1.630000	0.150000	0.890000	0.070000
Mexico	2.617414	1.745690	0.846034	0.087069	0.329655	0.134828
Morocco	2.416364	1.610000	0.776818	0.010909	0.361818	0.148636
Netherlands	2.738571	1.794286	0.925714	0.058571	0.427143	0.155000
Norway	3.230000	1.510000	1.720000	0.000000	0.690000	0.140000
Palestine	3.090000	2.300000	0.790000	0.050000	0.370000	0.050000
Peru	2.462000	1.260000	1.194000	0.026000	0.480000	0.158000
Poland	2.607500	1.732500	0.840000	0.060000	0.370000	0.150000
Portugal	3.133333	2.103333	1.015000	0.030000	0.345000	0.286667
Russian Federation	2.674000	1.790000	0.846000	0.036000	0.298000	0.108000
Singapore	3.565000	2.485000	1.085000	0.000000	0.615000	0.060000
Spain	2.604250	1.636500	0.931000	0.099750	0.406000	0.163000
Sweden	2.962857	1.934286	1.000000	0.190000	0.384286	0.140000
Switzerland	3.032308	1.784615	1.144615	0.147692	0.468462	0.145385
Syria	3.570000	2.570000	1.000000	0.140000	0.290000	0.290000
Thailand	2.557143	1.511429	0.922857	0.057143	0.372857	0.048571
Turkey	2.328333	1.535000	0.793333	0.130000	0.420000	0.125000
United Kingdom	3.079412	1.823529	1.206471	0.077647	0.408824	0.241765
Vietnam	2.860000	1.853333	0.926667	0.068333	0.368333	0.120000

# 4.2.4 Compare negative emotions for each country

```
[72]: plt.rcParams["figure.figsize"] = (5,12) groupby_coun_mean_df_2[['anx','anger','sad']].plot.barh()
```

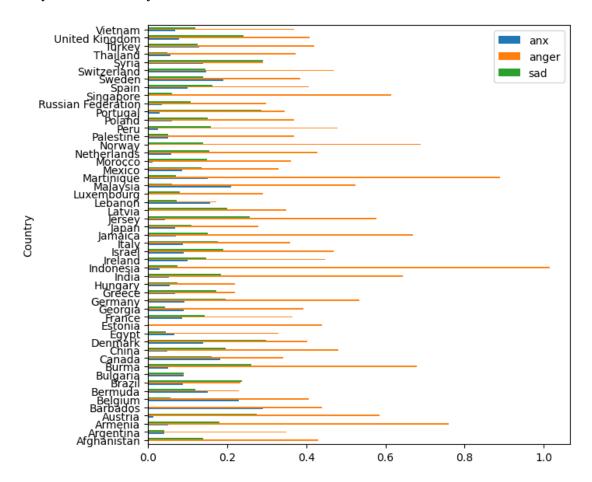
[72]: <Axes: ylabel='Country'>



### 4.2.5 Compare negative emotions for each continent

```
[73]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_2[['anx','anger','sad']].plot.barh()
```

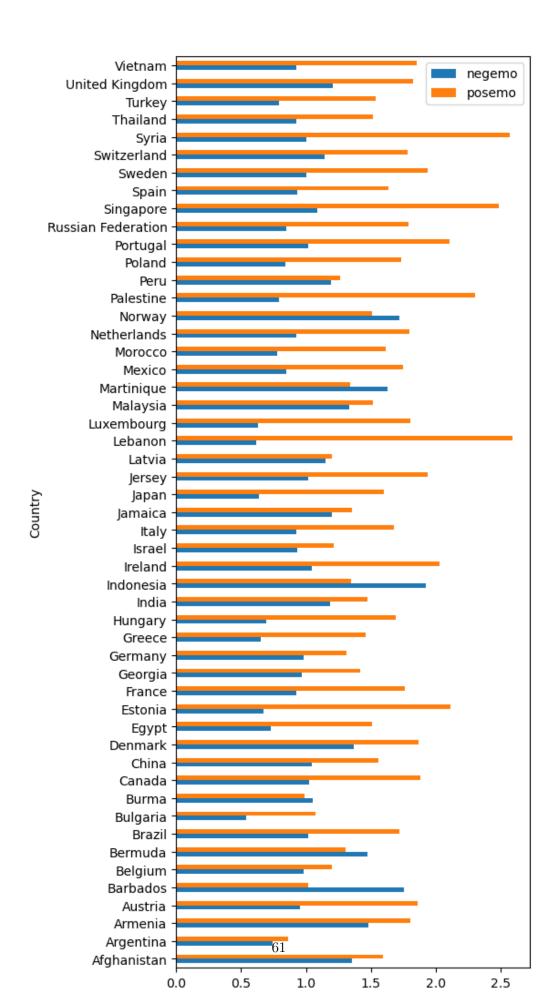
[73]: <Axes: ylabel='Country'>



#### 4.2.6 Compare positive end negative emotions in each country

```
[74]: plt.rcParams["figure.figsize"] = (5,13)
groupby_coun_mean_df_2[['negemo','posemo']].plot.barh()
```

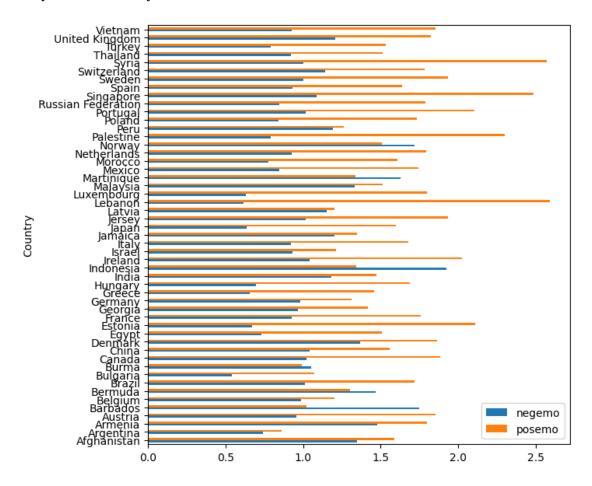
[74]: <Axes: ylabel='Country'>



### 4.2.7 Compare positive end negative emotions in each continent

```
[75]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_2[['negemo','posemo']].plot.barh()
```

[75]: <Axes: ylabel='Country'>



#### 4.3 Era 3: 2000 - 2009

```
[76]: df3_liwc = pd.read_csv('./era3_LIWC2015.csv')
df3_liwc = df3_liwc.drop("Source (A)",axis=1)

df3_liwc.insert(1,"Country","")
df3_liwc.insert(1,"Continent","")
df3_liwc["Country"] = df_3["Country"]
df3_liwc["Continent"] = df_3["Continent"]
```

```
df3_liwc = df3_liwc[df3_liwc['Country'] != "United States of America"]
df3_liwc
```

```
[76]:
                                                    Source (B) Continent \
      0
           Headnote A well-prepared meal might be the way...
                                                                  Europe
      1
           THERE are two ways to give a dinner party and ...
                                                                  Europe
      2
           Headnote A rare instance in which fat is your ...
                                                                  Europe
      3
           Headnote How I Learned to Stop Worrying... Hea...
                                                                Americas
      6
           WHILE French restaurant and country cooking ha...
                                                                  Europe
          Want to make some extra dough on weekends? Piz...
      993
                                                                  Europe
      994
          PAUL LIEBRANDT wants the world to know that he...
                                                                  Europe
           MICHAEL RUHLMAN says his new book, "Ratio: The...
      995
                                                                  Europe
      996
           WHEN you've gained enough experience cooking, ...
                                                                  Europe
           AS if a menu with lamb's tongue, calf's heart,...
      997
                                                                  Europe
                  Country
                                                              Source (C)
      0
                    Spain
                                                 Cooking; Recipes; Food
      1
                    Italy
                                                                     NaN
              Netherlands
                                                 Recipes; Meat; Cooking
      2
      3
                   Brazil
                                Social life & customs; Cooking; Recipes
      6
                   France
                                                        Cooking; Recipes
                       . . .
      993
                  Albania
                                                Pizza; Cooking; Recipes
                                                             Restaurants
      994
           United Kingdom
      995
                            Cooking; Recipes; Cookbooks; Books -- Ratio
                   France
      996
                    Italy
                                    Vegetables; Recipes; Cooking; Soups
                                        Restaurants -- Feast-Houston TX
      997
           United Kingdom
                                                    Source (D)
      0
                                        A taste for seduction
      1
           Give the Guests a Chef's Apron and Let the Coo...
      2
                                               Lvoe me tender
      3
           How I learned to stop worrying...and entertain...
      6
               Born in a French Cafe, Growing Up in New York
      993
                                                    Crust Fund
      994
                                             At Home, at Last
      995
                        Everyday Cooking Is as Easy as 3:2:1
      996
                          A Soup Only a Tuscan Could Think Up
      997
                     British Derring-Do, Innards a Specialty
                                                    Source (E)
                                                                Source (F)
                            New York Times Magazine; New York
      0
                                                                    2000.0
      1
           New York Times, Late Edition (East Coast); New...
                                                                    2000.0
      2
                            New York Times Magazine; New York
                                                                    2000.0
```

```
3
                       New York Times Magazine; New York
                                                                  2000.0
6
     New York Times, Late Edition (East Coast); New...
                                                                  2000.0
. .
                                                                      . . .
                       New York Times Magazine; New York
993
                                                                  2009.0
994
     New York Times, Late Edition (East Coast); New...
                                                                  2009.0
     New York Times, Late Edition (East Coast); New...
995
                                                                  2009.0
     New York Times, Late Edition (East Coast); New...
996
                                                                  2009.0
     New York Times, Late Edition (East Coast); New...
997
                                                                  2009.0
          Source (G)
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                                 87.93
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                                                                       0.00
            New York 1738
                                         . . .
                                               6.73
                                                       0.63
                                                                                0.00
1
     New York, N.Y.
                       1690
                                 95.15
                                               5.15
                                                       1.18
                                                               0.00
                                                                       0.00
                                                                                0.00
                                         . . .
2
            New York
                       1699
                                 98.39
                                               7.42
                                                       0.29
                                                               0.00
                                                                       0.00
                                                                                0.00
                                         . . .
3
            New York
                       2214
                                 81.06
                                         . . .
                                               5.69
                                                       0.41
                                                               0.45
                                                                       0.27
                                                                                0.05
6
     New York, N.Y.
                       2390
                                 94.11
                                               6.40
                                                       0.67
                                                               0.59
                                                                       0.08
                                                                                0.04
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993
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            New York
                       1413
                                 93.83
                                         . . .
                                               6.23
                                                       0.42
                                                                       0.35
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     New York, N.Y.
                                               7.97
                                                                       0.09
994
                       2157
                                 92.49
                                         . . .
                                                       0.93
                                                               0.60
                                                                                0.00
995
     New York, N.Y.
                       1815
                                 94.40
                                               5.01
                                                       2.98
                                                               0.39
                                                                       0.06
                                                                                0.00
                                         . . .
996
     New York, N.Y.
                        659
                                 81.31
                                               8.50
                                                       0.91
                                                               0.30
                                                                       0.00
                                                                                0.00
                                         . . .
                                 90.03
                                               6.98
                                                                                0.00
997
     New York, N.Y.
                       2892
                                        . . .
                                                       0.93
                                                               0.35
                                                                       0.07
                                       OtherP
     Dash
            Quote Apostro
                             Parenth
0
     1.15
             0.12
                       1.55
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1
     1.60
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                       0.71
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2
     2.30
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                       0.35
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                                          0.94
3
     0.86
             0.27
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6
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993
    1.34
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994 1.67
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             3.25
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                                 1.76
     2.64
995
             3.86
                       0.77
                                 3.97
                                          0.72
     2.12
                                          2.43
996
             0.30
                       0.61
                                 1.82
     2.04
997
             1.38
                       2.18
                                 1.31
                                          0.73
```

[900 rows x 101 columns]

# 4.3.1 Use groupby function to produce the mean value in each quantitative column for each country

```
[77]: groupby_coun_mean_df_3 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_coun_mean_df_3 = groupby_coun_mean_df_3.drop(groupby_coun_mean_df_3.

→index[0])
groupby_coun_mean_df_3 = groupby_coun_mean_df_3.drop("Source (F)",axis=1)
groupby_coun_mean_df_3
```

[77]:		WC	Analytic	Clout	Authentic	Tone	\
LIII.	Country	WO	Analytic	Olout	Authentic	10116	\
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	
	Bermuda	541.000000	90.295000	48.145000	24.885000	23.545000	
	Brazil	1744.666667	95.586667	47.893333	18.612222	38.496667	
	Bulgaria	1118.000000	96.450000	42.540000	9.800000	35.120000	
	Burma	1912.000000	94.640000	63.310000	20.990000	24.930000	
	Canada	1059.692308	95.527692	48.241538	19.528462	41.510000	
	China	1402.625000	95.066641	48.824375	18.128047	35.558750	
	Denmark	947.500000	89.425000	54.180000	10.857500	34.347500	
	Egypt	1174.250000	97.278333	55.270833	23.430833	39.959167	
	Estonia	899.000000	97.170000	60.540000	25.940000	52.920000	
	France	1526.578462	96.130708	50.012646	17.612769	41.174892	
	Georgia	2040.666667	98.043333	51.456667	18.253333	34.220000	
	Germany	1404.285714	94.748571	53.110000	15.520000	32.054286	
	Greece	1025.709677	95.969677	45.147742	15.301613	40.556452	
	Hungary	1649.250000	96.645000	46.395000	14.622500	44.110000	
	India	1725.800000	94.903600	52.015600	17.686000	31.194000	
	Indonesia	1516.500000	95.740000	46.640000	7.640000	18.345000	
	Ireland	1994.000000	89.526000	56.042000	19.410000	43.746000	
	Israel	2143.000000	87.490000	51.870000	17.530000	30.500000	
	Italy	1384.706140	95.111140	49.084649	17.567368	39.806184	
	Jamaica	2673.000000	95.940000	51.050000	17.590000	28.260000	
	Japan	1699.535714	95.610357	50.469643	18.332143	43.664643	
	Jersey	1614.125000	95.925000	47.405000	18.570000	42.515000	
	Latvia	1996.000000	97.610000	59.700000	11.290000	26.600000	
	Lebanon	1979.333333	95.763333	59.640000	14.326667	62.370000	
	Luxembourg	2394.000000	97.740000	51.840000	21.620000	47.390000	
	Malaysia	1934.500000	94.100000	48.880000	14.080000	29.370000	
	Martinique	1348.000000	92.170000	42.640000	5.820000	21.220000	
	Mexico	1447.896552	95.712069	49.854483	17.680690	42.423793	
	Morocco	1166.954545	95.141818	49.725455	18.417273	41.380909	
	Netherlands	1650.142857	94.834286	54.525000	13.259286	41.741429	
	Norway	1453.000000	95.360000	48.900000	11.630000	22.570000	
	Palestine	1909.000000	95.720000	64.710000	12.660000	54.370000	
	Peru	978.000000	96.814000	48.882000	8.342000	27.174000	
	Poland	1450.750000	91.037500	45.872500	14.687500	42.110000	
	Portugal	1766.666667	91.348333	54.671667	17.136667	46.013333	
	Russian Federation	1465.200000	95.214000	49.008000	12.566000	43.070000	
	Singapore	1710.000000	95.510000	57.875000	14.825000	52.060000	
	Spain	1180.925000	95.416250	48.128000	19.387250	38.898750	
	Sweden	2310.142857	95.510000	48.870000	15.304286	42.837143	

Switzerland	2088.461538	8 95.96307	7 48.57615	4 13.41153	8 37.2307	69
Syria	700.000000					
Thailand	1892.857143					
Turkey	966.833333					
United Kingdom	1443.647059					
Vietnam	2016.166667					
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Country					•	
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	
•						

Peru	12.648000	17.694000	64.694000	35.8940	00 2.342000 .
Poland	15.837500	17.127500			
Portugal	13.598333	19.120000			
Russian Federation	12.856000	18.190000			
Singapore	16.845000	19.620000			
Spain	14.534250	18.534500			
Sweden	13.571429	19.244286			
Switzerland	14.965385	18.973077			
Syria	14.580000	21.430000			
Thailand	15.767143	19.845714			
Turkey	13.855000	19.630000			
United Kingdom	13.719412	17.574118			
Vietnam	15.136667	19.066667			
V I O O II CIII	10.10000.	10.000001	01.000000	01.1000	
	Comma	Colon	SemiC	QMark	Exclam \
Country					
Afghanistan	7.600000	0.290000	0.140000 0	.000000	0.00000
Argentina	6.660000	0.700000	0.190000 0	.000000	0.00000
Armenia	6.210000	0.300000	0.050000 0	.000000	0.00000
Austria	5.333333	0.831667	0.085000 0	.071667	0.00000
Barbados	5.840000	0.290000	0.150000 0	.000000	0.00000
Belgium	5.490000	0.390000	0.255714 0	.000000	0.00000
Bermuda	4.840000	0.505000	0.235000 0	.305000	0.00000
Brazil	6.341111	0.320000	0.076667 0	.032222	0.011111
Bulgaria	5.460000	0.540000	0.090000 0	.000000	0.00000
Burma	6.540000	1.150000	0.210000 0	.000000	0.050000
Canada	4.960769	0.364615	0.065385 0	.000000	0.00000
China	5.492500	0.581406	0.168281 0	.035469	0.002812
Denmark	6.440000	0.605000	0.015000 0	.132500	0.00000
Egypt	5.274167	0.928333	0.063333 0	.011667	0.00000
Estonia	5.780000	0.330000	0.110000 0	.110000	0.00000
France	5.226800	0.526092	0.117200 0	.035785	0.004154
Georgia	5.560000	0.356667	0.086667 0	.013333	0.016667
Germany	4.552857	0.454286	0.184286 0	.085714	0.00000
Greece	5.346129	0.605161	0.123871 0	.000000	0.00000
Hungary	4.495000	0.487500	0.235000 0	.000000	0.00000
India	6.070800	0.469200	0.136800 0	.014400	0.006000
Indonesia	6.570000	0.375000	0.180000 0	.000000	0.00000
Ireland	5.504000	0.800000	0.210000 0	.332000	0.00000
Israel	6.350000	0.470000	0.050000 0	.000000	0.00000
Italy	5.460132	0.601667	0.125175 0	.030044	0.004868
Jamaica	8.190000	0.340000	0.040000 0	.000000	0.00000
Japan	5.297500				0.004643
Jersey	7.520000				0.00000
Latvia	7.520000				0.00000
Lebanon	6.520000				0.026667
Luxembourg	5.680000				0.000000
0	*				

Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
	Dash	Quote	Apostro	Parenth	OtherP
Country					
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
Georgia	0.943333	0.000000	1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000

```
Italy
                   1.134518
                             0.004561 1.355307
                                                0.780746 1.277851
Jamaica
                   1.270000
                             0.000000
                                      1.420000
                                                1.720000 2.920000
Japan
                   1.207857
                             0.000000 1.271429
                                                0.810000 1.641071
Jersey
                   0.841250
                             0.000000 1.142500
                                                1.323750 3.186250
Latvia
                             0.000000 5.760000
                                                0.200000 2.710000
                   1.500000
Lebanon
                             0.000000
                                      1.510000
                                                0.690000 1.386667
                   1.040000
Luxembourg
                   2.800000
                             0.000000
                                      2.300000
                                                0.630000 1.040000
Malaysia
                   1.375000
                             0.000000 1.440000
                                                0.530000 4.075000
Martinique
                   1.410000
                             0.000000 0.300000
                                                0.590000 6.080000
Mexico
                   1.539828
                             0.001552
                                      1.297759
                                                0.895690 1.517241
Morocco
                   0.961364
                             0.000000 0.535455
                                                0.841364 1.594545
Netherlands
                             0.000000 2.865000
                                                0.672857 1.208571
                   1.603571
Norway
                   0.760000
                             0.000000 0.140000
                                                2.060000 1.650000
Palestine
                   1.520000
                             0.000000
                                      3.820000
                                                0.840000 0.470000
Peru
                             0.000000
                                      0.572000
                                                0.368000 0.656000
                   1.168000
Poland
                   1.010000
                             0.000000
                                      2.065000
                                                0.880000 0.865000
Portugal
                             0.028333 4.128333
                                                0.825000 1.115000
                   1.391667
Russian Federation
                   1.280000
                             0.000000
                                      1.440000
                                                1.126000 1.060000
Singapore
                   1.110000
                             0.000000
                                      2.310000
                                                0.235000 0.760000
Spain
                             0.002000 1.062000
                                                0.897000 1.733500
                   1.196750
Sweden
                   1.035714
                             0.004286
                                      2.001429
                                                1.207143 1.084286
                                                0.756923 1.960769
Switzerland
                   1.075385
                             0.003846 1.330769
                             0.000000 3.000000 0.860000 0.430000
Syria
                   2.570000
Thailand
                                                1.081429 1.437143
                   1.134286
                             0.000000 2.298571
Turkey
                   1.031667
                             0.000000
                                      1.600000
                                                0.430000 0.946667
United Kingdom
                   0.970000
                             0.000000
                                      1.460000
                                                0.935294 1.944118
Vietnam
                   1.126667
                             0.000000
                                      2.645000 1.141667
                                                         1.460000
```

[51 rows x 93 columns]

# 4.3.2 Use groupby function to produce the mean value in each quantitative column for each continent

```
[78]: groupby_con_mean_df_3 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_con_mean_df_3 = groupby_con_mean_df_3.drop(groupby_con_mean_df_3.

index[0])
groupby_con_mean_df_3 = groupby_con_mean_df_3.drop("Source (F)",axis=1)
groupby_con_mean_df_3
```

[78]:		WC	Analytic	Clout	Authentic	Tone	\
	Country						
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	

```
Bermuda
                      541.000000
                                  90.295000
                                              48.145000
                                                         24.885000
                                                                     23.545000
Brazil
                     1744.666667
                                  95.586667
                                              47.893333
                                                         18.612222
                                                                     38.496667
Bulgaria
                     1118.000000
                                  96.450000
                                              42.540000
                                                          9.800000
                                                                     35.120000
Burma
                     1912.000000
                                  94.640000
                                              63.310000
                                                         20.990000
                                                                     24.930000
Canada
                                  95.527692
                     1059.692308
                                              48.241538
                                                         19.528462
                                                                     41.510000
China
                     1402.625000
                                  95.066641
                                              48.824375
                                                         18.128047
                                                                     35.558750
Denmark
                      947.500000
                                  89.425000
                                              54.180000
                                                         10.857500
                                                                     34.347500
Egypt
                     1174.250000
                                  97.278333
                                              55.270833
                                                         23.430833
                                                                     39.959167
Estonia
                      899.000000
                                  97.170000
                                              60.540000
                                                         25.940000
                                                                     52.920000
France
                                  96.130708
                     1526.578462
                                              50.012646
                                                         17.612769
                                                                     41.174892
Georgia
                     2040.666667
                                  98.043333
                                              51.456667
                                                         18.253333
                                                                     34.220000
Germany
                     1404.285714
                                  94.748571
                                              53.110000
                                                         15.520000
                                                                     32.054286
Greece
                     1025.709677
                                  95.969677
                                              45.147742
                                                         15.301613
                                                                     40.556452
Hungary
                     1649.250000
                                  96.645000
                                              46.395000
                                                         14.622500
                                                                     44.110000
India
                     1725.800000
                                  94.903600
                                              52.015600
                                                         17.686000
                                                                     31.194000
Indonesia
                     1516.500000
                                  95.740000
                                              46.640000
                                                          7.640000
                                                                     18.345000
Ireland
                     1994.000000
                                  89.526000
                                              56.042000
                                                                     43.746000
                                                         19.410000
Israel
                     2143.000000
                                  87.490000
                                              51.870000
                                                         17.530000
                                                                     30.500000
Italy
                     1384.706140
                                  95.111140
                                              49.084649
                                                         17.567368
                                                                     39.806184
Jamaica
                                  95.940000
                     2673.000000
                                              51.050000
                                                         17.590000
                                                                     28.260000
Japan
                     1699.535714
                                  95.610357
                                              50.469643
                                                         18.332143
                                                                     43.664643
                                              47.405000
Jersey
                     1614.125000
                                  95.925000
                                                         18.570000
                                                                     42.515000
Latvia
                                  97.610000
                                              59.700000
                                                         11.290000
                                                                     26.600000
                     1996.000000
Lebanon
                     1979.333333
                                  95.763333
                                              59.640000
                                                         14.326667
                                                                     62.370000
Luxembourg
                                  97.740000
                                              51.840000
                                                                     47.390000
                     2394.000000
                                                         21.620000
Malaysia
                     1934.500000
                                  94.100000
                                              48.880000
                                                         14.080000
                                                                     29.370000
                                              42.640000
Martinique
                     1348.000000
                                  92.170000
                                                          5.820000
                                                                     21.220000
Mexico
                     1447.896552
                                  95.712069
                                              49.854483
                                                         17.680690
                                                                     42.423793
Morocco
                     1166.954545
                                  95.141818
                                              49.725455
                                                         18.417273
                                                                     41.380909
                                              54.525000
Netherlands
                     1650.142857
                                  94.834286
                                                         13.259286
                                                                     41.741429
                                  95.360000
                                              48.900000
Norway
                     1453.000000
                                                         11.630000
                                                                     22.570000
Palestine
                     1909.000000
                                  95.720000
                                              64.710000
                                                         12.660000
                                                                     54.370000
Peru
                      978.000000
                                  96.814000
                                              48.882000
                                                          8.342000
                                                                     27.174000
Poland
                     1450.750000
                                  91.037500
                                              45.872500
                                                         14.687500
                                                                     42.110000
                                  91.348333
                                                                     46.013333
Portugal
                     1766.666667
                                              54.671667
                                                         17.136667
Russian Federation
                    1465.200000
                                  95.214000
                                              49.008000
                                                         12.566000
                                                                     43.070000
                                                                     52.060000
                                              57.875000
Singapore
                     1710.000000
                                  95.510000
                                                         14.825000
Spain
                                  95.416250
                                              48.128000
                     1180.925000
                                                         19.387250
                                                                     38.898750
Sweden
                     2310.142857
                                  95.510000
                                              48.870000
                                                         15.304286
                                                                     42.837143
Switzerland
                     2088.461538
                                  95.963077
                                              48.576154
                                                         13.411538
                                                                     37.230769
Syria
                      700.000000
                                  97.730000
                                              56.250000
                                                         27.590000
                                                                     55.390000
Thailand
                     1892.857143
                                  95.334286
                                              52.005714
                                                         16.937143
                                                                     36.967143
Turkey
                                              50.925000
                      966.833333
                                  95.601667
                                                         11.990000
                                                                     39.153333
United Kingdom
                     1443.647059
                                  97.135294
                                              48.982353
                                                         24.242353
                                                                     37.231765
                                  95.033333
                                              55.100000
                                                         16.225000
Vietnam
                     2016.166667
                                                                     42.981667
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WPS

Country						
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	• • •
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	• • •
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	• • •
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	• • •
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	• • •
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	• • •
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	• • •
Peru	12.648000	17.694000	64.694000	35.894000	2.342000	• • •
Poland	15.837500	17.127500	69.510000	37.850000	5.610000	• • •
Portugal	13.598333	19.120000	70.511667	39.573333	6.020000	
Russian Federation	12.856000	18.190000	65.362000	35.560000	3.202000	• • •
Singapore	16.845000	19.620000	71.405000	37.830000	3.595000	• • •
Spain	14.534250	18.534500	68.586500	38.346250	3.595000	• • •
Sweden	13.571429	19.244286	65.941429	34.744286	3.494286	• • •
Switzerland	14.965385	18.973077	67.793846	37.250769	3.877692	

Syria	14.580000	21.430000	72.8600	00 38.710	000 3.290000	
Thailand	15.767143	19.845714	67.1057	14 36.8028	857 4.047143	
Turkey	13.855000	19.630000	65.3500	00 36.353	333 3.866667	••
United Kingdom	13.719412	17.574118	68.7576	47 38.4076	647 4.081765	
Vietnam	15.136667	19.066667	67.5900	00 37.1883	333 4.503333	
	Comma	Colon	SemiC	QMark	Exclam \	
Country						
Afghanistan	7.600000		0.140000	0.000000	0.000000	
Argentina	6.660000		0.190000	0.000000	0.000000	
Armenia	6.210000		0.050000	0.000000	0.00000	
Austria	5.333333		0.085000	0.071667	0.00000	
Barbados	5.840000	0.290000	0.150000	0.000000	0.000000	
Belgium	5.490000		0.255714	0.000000	0.000000	
Bermuda	4.840000		0.235000	0.305000	0.000000	
Brazil	6.341111		0.076667	0.032222	0.011111	
Bulgaria	5.460000		0.090000	0.000000	0.000000	
Burma	6.540000		0.210000	0.000000	0.050000	
Canada	4.960769		0.065385	0.000000	0.000000	
China	5.492500		0.168281	0.035469	0.002812	
Denmark	6.440000	0.605000	0.015000	0.132500	0.000000	
Egypt	5.274167	0.928333	0.063333	0.011667	0.000000	
Estonia	5.780000	0.330000	0.110000	0.110000	0.000000	
France	5.226800	0.526092	0.117200	0.035785	0.004154	
Georgia	5.560000	0.356667	0.086667	0.013333	0.016667	
Germany	4.552857	0.454286	0.184286	0.085714	0.000000	
Greece	5.346129		0.123871	0.000000	0.000000	
Hungary	4.495000	0.487500	0.235000	0.000000	0.000000	
India	6.070800	0.469200	0.136800	0.014400	0.006000	
Indonesia	6.570000	0.375000	0.180000	0.000000	0.000000	
Ireland	5.504000	0.800000	0.210000	0.332000	0.000000	
Israel	6.350000	0.470000	0.050000	0.000000	0.000000	
Italy	5.460132	0.601667	0.125175	0.030044	0.004868	
Jamaica	8.190000	0.340000	0.040000	0.000000	0.000000	
Japan	5.297500	0.683214	0.130000	0.017500	0.004643	
Jersey	7.520000	0.372500	0.068750	0.018750	0.000000	
Latvia	7.520000	0.350000	0.100000	0.000000	0.000000	
Lebanon	6.520000	0.356667	0.273333	0.000000	0.026667	
Luxembourg	5.680000	0.330000	0.080000	0.000000	0.000000	
Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000	
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000	
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690	
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000	
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000	
Norway	5.640000	0.960000	0.210000	0.000000	0.000000	
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000	
Peru	5.628000	0.550000	0.026000	0.000000	0.000000	

<b>D</b> .					
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
7 - 0 0 - 1 - 1 - 1	0.00000				0.02000
	Dash	0110+0	Anogtro	Daran+h	OtherP
Country	Dasii	Quote	Apostro	Parenth	Otherr
Country	0 670000	0 000000	2 000000	1 050000	2 000000
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
		0.004092			
Georgia	0.943333		1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000
Italy	1.134518	0.004561	1.355307	0.780746	1.277851
Jamaica	1.270000	0.000000	1.420000	1.720000	2.920000
Japan	1.207857	0.000000	1.271429	0.810000	1.641071
Jersey	0.841250	0.000000	1.142500	1.323750	3.186250
Latvia	1.500000	0.000000	5.760000	0.200000	2.710000
Lebanon	1.040000	0.000000	1.510000	0.690000	1.386667
Luxembourg	2.800000	0.000000	2.300000	0.630000	1.040000
Malaysia	1.375000	0.000000	1.440000	0.530000	4.075000
патауыта	1.07000	0.00000	1.440000	0.00000	±.010000

```
Martinique
                    1.410000
                             0.000000
                                       0.300000
                                                 0.590000 6.080000
Mexico
                    1.539828
                             0.001552
                                       1.297759
                                                 0.895690
                                                           1.517241
Morocco
                    0.961364
                             0.000000
                                       0.535455
                                                 0.841364 1.594545
Netherlands
                    1.603571
                             0.000000
                                       2.865000
                                                 0.672857
                                                           1.208571
                    0.760000
                             0.000000
                                       0.140000
                                                 2.060000 1.650000
Norway
Palestine
                    1.520000
                             0.000000
                                       3.820000
                                                 0.840000
                                                           0.470000
Peru
                             0.000000
                                       0.572000
                                                 0.368000
                    1.168000
                                                           0.656000
Poland
                    1.010000
                             0.000000
                                       2.065000
                                                 0.880000
                                                           0.865000
Portugal
                    1.391667
                             0.028333
                                       4.128333
                                                 0.825000
                                                           1.115000
Russian Federation
                             0.000000
                                       1.440000
                                                 1.126000 1.060000
                   1.280000
                                       2.310000
Singapore
                    1.110000
                             0.000000
                                                 0.235000
                                                           0.760000
Spain
                    1.196750
                             0.002000
                                       1.062000
                                                 0.897000
                                                           1.733500
Sweden
                    1.035714
                             0.004286
                                       2.001429
                                                 1.207143 1.084286
Switzerland
                    1.075385
                             0.003846
                                       1.330769
                                                 0.756923 1.960769
Syria
                    2.570000
                             0.000000
                                       3.000000
                                                 0.860000 0.430000
Thailand
                    1.134286
                             0.000000
                                       2.298571
                                                 1.081429
                                                           1.437143
Turkey
                             0.000000
                                       1.600000
                                                 0.430000
                                                           0.946667
                    1.031667
United Kingdom
                             0.000000
                                       1.460000
                    0.970000
                                                 0.935294
                                                           1.944118
Vietnam
                    1.126667
                             0.000000
                                       2.645000
                                                 1.141667
                                                           1.460000
```

[51 rows x 93 columns]

#### 4.3.3 Show only the columns of "Affective processes" and its sub-codes

[79]:	groupby_coun_mean_df_3[['affect','posemo', 'negemo', 'anx', 'anger', 'sad']]							
[79]:		affect	posemo	negemo	anx	anger	sad	
	Country							
	Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000	
	Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000	
	Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000	
	Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167	
	Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.00000	
	Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143	
	Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000	
	Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778	
	Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000	
	Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000	
	Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769	
	China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094	
	Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500	
	Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167	
	Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.00000	
	France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200	
	Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333	
	Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714	
	Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226	

```
Hungary
                    2.382500
                              1.687500
                                        0.695000
                                                  0.055000
                                                            0.220000
                                                                      0.075000
India
                    2.718000
                              1.474000
                                        1.182400
                                                  0.052000
                                                            0.644000
                                                                      0.184800
Indonesia
                    3.265000
                              1.345000
                                        1.925000
                                                  0.030000
                                                            1.015000
                                                                      0.075000
Ireland
                    3.080000
                              2.024000
                                        1.044000
                                                  0.100000
                                                            0.448000
                                                                      0.148000
Israel
                              1.210000
                                        0.930000
                                                  0.090000
                                                            0.470000 0.190000
                    2.150000
Italy
                              1.678465
                                        0.923816
                                                  0.087325
                                                            0.358465
                    2.634868
                                                                      0.176316
Jamaica
                    2.580000
                              1.350000
                                        1.200000
                                                  0.070000
                                                            0.670000
                                                                      0.150000
Japan
                    2.291071
                              1.596071
                                        0.636786
                                                  0.069286
                                                            0.279643
                                                                      0.110357
Jersey
                    2.957500
                              1.933750
                                        1.016250
                                                  0.042500
                                                            0.577500
                                                                      0.257500
Latvia
                                                            0.350000
                    2.350000
                              1.200000
                                        1.150000
                                                  0.000000
                                                                      0.200000
Lebanon
                    3.223333
                              2.590000
                                        0.616667
                                                  0.156667
                                                            0.173333
                                                                      0.073333
Luxembourg
                              1.800000
                                        0.630000
                                                  0.000000
                                                            0.290000
                                                                      0.080000
                    2.420000
Malaysia
                    2.945000
                              1.515000
                                        1.335000
                                                  0.210000
                                                            0.525000
                                                                      0.060000
Martinique
                    2.970000
                              1.340000
                                        1.630000
                                                  0.150000
                                                            0.890000
                                                                      0.070000
Mexico
                    2.617414
                              1.745690
                                        0.846034
                                                  0.087069
                                                            0.329655
                                                                      0.134828
Morocco
                    2.416364
                              1.610000
                                        0.776818
                                                  0.010909
                                                            0.361818
                                                                      0.148636
Netherlands
                              1.794286
                                        0.925714
                                                  0.058571
                                                            0.427143
                                                                      0.155000
                    2.738571
                                                            0.690000
Norway
                    3.230000
                              1.510000
                                        1.720000
                                                  0.000000
                                                                      0.140000
Palestine
                    3.090000
                              2.300000
                                        0.790000
                                                  0.050000
                                                            0.370000
                                                                      0.050000
Peru
                              1.260000
                                        1.194000
                                                  0.026000
                                                            0.480000
                    2.462000
                                                                      0.158000
Poland
                    2.607500
                              1.732500
                                        0.840000
                                                  0.060000
                                                            0.370000
                                                                      0.150000
                              2.103333
                                        1.015000
                                                  0.030000
                                                            0.345000
Portugal
                    3.133333
                                                                      0.286667
Russian Federation
                              1.790000
                                        0.846000
                                                  0.036000
                                                            0.298000
                                                                      0.108000
                    2.674000
Singapore
                    3.565000
                              2.485000
                                        1.085000
                                                  0.000000
                                                            0.615000
                                                                      0.060000
Spain
                                        0.931000
                                                            0.406000
                    2.604250
                              1.636500
                                                  0.099750
                                                                      0.163000
Sweden
                    2.962857
                              1.934286
                                        1.000000
                                                  0.190000
                                                            0.384286
                                                                      0.140000
                                        1.144615
Switzerland
                    3.032308
                              1.784615
                                                  0.147692
                                                            0.468462
                                                                      0.145385
Syria
                    3.570000
                              2.570000
                                        1.000000
                                                  0.140000
                                                            0.290000
                                                                      0.290000
                              1.511429
Thailand
                    2.557143
                                        0.922857
                                                  0.057143
                                                            0.372857
                                                                      0.048571
                                                            0.420000
Turkey
                    2.328333
                              1.535000
                                        0.793333
                                                  0.130000
                                                                      0.125000
United Kingdom
                                                            0.408824
                    3.079412
                              1.823529
                                        1.206471
                                                  0.077647
                                                                      0.241765
Vietnam
                    2.860000
                              1.853333
                                        0.926667
                                                  0.068333
                                                            0.368333
                                                                      0.120000
groupby_con_mean_df_3[['affect','posemo', 'negemo', 'anx', 'anger', 'sad']]
```

[80]:

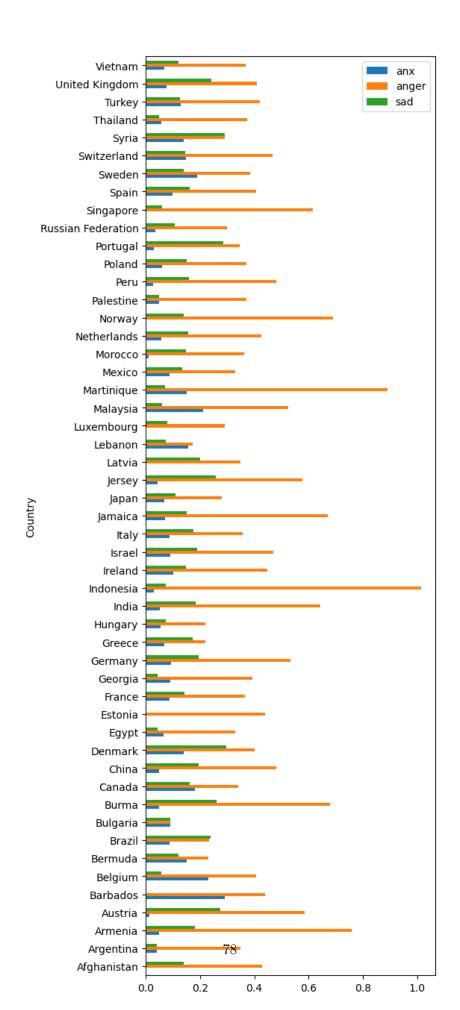
[80]:		affect	posemo	negemo	anx	anger	sad
	Country						
	Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000
	Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000
	Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000
	Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167
	Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.000000
	Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143
	Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000
	Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778
	Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000
	Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000

Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769
China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094
Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500
Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167
Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.000000
France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200
Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333
Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714
Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226
Hungary	2.382500	1.687500	0.695000	0.055000	0.220000	0.075000
India	2.718000	1.474000	1.182400	0.052000	0.644000	0.184800
Indonesia	3.265000	1.345000	1.925000	0.030000	1.015000	0.075000
Ireland	3.080000	2.024000	1.044000	0.100000	0.448000	0.148000
Israel	2.150000	1.210000	0.930000	0.090000	0.470000	0.190000
Italy	2.634868	1.678465	0.923816	0.087325	0.358465	0.176316
Jamaica	2.580000	1.350000	1.200000	0.070000	0.670000	0.150000
Japan	2.291071	1.596071	0.636786	0.069286	0.279643	0.110357
Jersey	2.957500	1.933750	1.016250	0.042500	0.577500	0.257500
Latvia	2.350000	1.200000	1.150000	0.000000	0.350000	0.200000
Lebanon	3.223333	2.590000	0.616667	0.156667	0.173333	0.073333
Luxembourg	2.420000	1.800000	0.630000	0.000000	0.290000	0.080000
Malaysia	2.945000	1.515000	1.335000	0.210000	0.525000	0.060000
Martinique	2.970000	1.340000	1.630000	0.150000	0.890000	0.070000
Mexico	2.617414	1.745690	0.846034	0.087069	0.329655	0.134828
Morocco	2.416364	1.610000	0.776818	0.010909	0.361818	0.148636
Netherlands	2.738571	1.794286	0.925714	0.058571	0.427143	0.155000
Norway	3.230000	1.510000	1.720000	0.000000	0.690000	0.140000
Palestine	3.090000	2.300000	0.790000	0.050000	0.370000	0.050000
Peru	2.462000	1.260000	1.194000	0.026000	0.480000	0.158000
Poland	2.607500	1.732500	0.840000	0.060000	0.370000	0.150000
Portugal	3.133333	2.103333	1.015000	0.030000	0.345000	0.286667
Russian Federation	2.674000	1.790000	0.846000	0.036000	0.298000	0.108000
Singapore	3.565000	2.485000	1.085000	0.000000	0.615000	0.060000
Spain	2.604250	1.636500	0.931000	0.099750	0.406000	0.163000
Sweden	2.962857	1.934286	1.000000	0.190000	0.384286	0.140000
Switzerland	3.032308	1.784615	1.144615	0.147692	0.468462	0.145385
Syria	3.570000	2.570000	1.000000	0.140000	0.290000	0.290000
Thailand	2.557143	1.511429	0.922857	0.057143	0.372857	0.048571
Turkey	2.328333	1.535000	0.793333	0.130000	0.420000	0.125000
United Kingdom	3.079412	1.823529	1.206471	0.077647	0.408824	0.241765
Vietnam	2.860000	1.853333	0.926667	0.068333	0.368333	0.120000

# 4.3.4 Compare negative emotions for each country

```
[81]: plt.rcParams["figure.figsize"] = (5,16) groupby_coun_mean_df_3[['anx','anger','sad']].plot.barh()
```

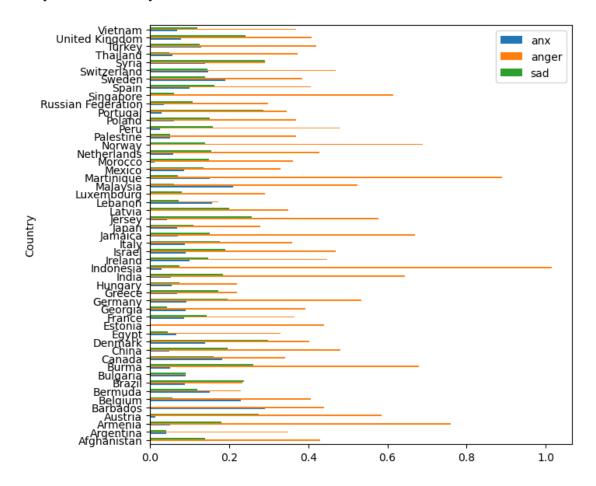
[81]: <Axes: ylabel='Country'>



## 4.3.5 Compare negative emotions for each continent

```
[82]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_3[['anx','anger','sad']].plot.barh()
```

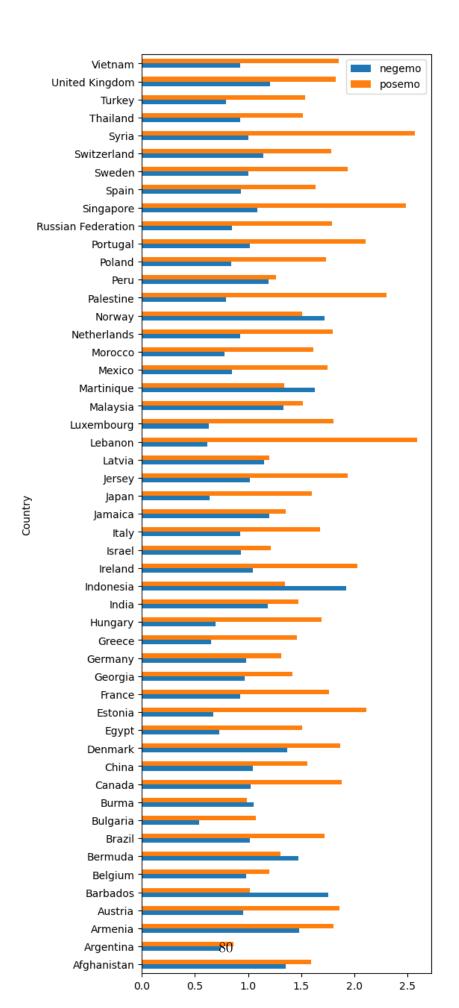
[82]: <Axes: ylabel='Country'>



### 4.3.6 Compare positive end negative emotions in each country

```
[83]: plt.rcParams["figure.figsize"] = (5,16) groupby_coun_mean_df_3[['negemo','posemo']].plot.barh()
```

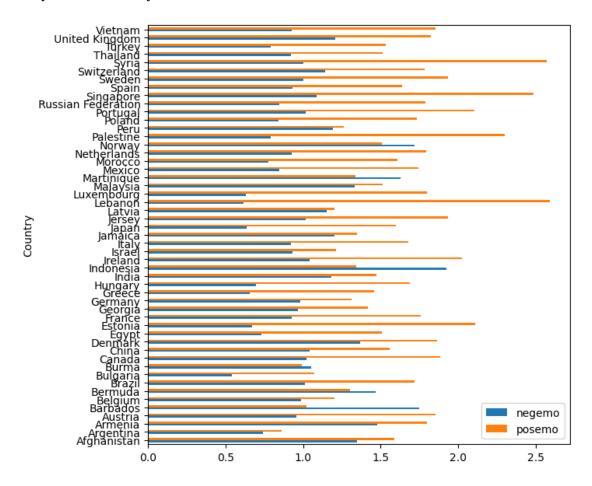
[83]: <Axes: ylabel='Country'>



## 4.3.7 Compare positive end negative emotions in each continent

```
[84]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_3[['negemo','posemo']].plot.barh()
```

[84]: <Axes: ylabel='Country'>



### 4.4 Era 4: 2010 - 2022

```
[85]: df4_liwc = pd.read_csv('./era4_LIWC2015.csv')
df4_liwc = df4_liwc.drop("Source (A)",axis=1)

df4_liwc.insert(1,"Country","")
df4_liwc.insert(2,"Continent","")
df4_liwc["Country"] = df_4["Country"]
df4_liwc["Continent"] = df_4["Continent"]
```

```
df4_liwc = df4_liwc[df4_liwc['Country'] != "United States of America"]
df4_liwc
```

```
[85]:
                                                     Source (B)
                                                                        Country \
      0
            I'VE made several concessions at my table in t...
                                                                          Italy
      1
            Most trends arise not from inspiration but fro...
                                                                         France
      3
            WHEN Julia Child introduced it to Americans ba...
                                                                         Greece
      4
            Headnote Mastering Maialino's braise-worthy sa...
                                                                    Netherlands
      5
            Headnote For some, mise en place is a dicey pr...
                                                                         France
            . At chef Gabriel Kreuther's New York City res...
      2263
                                                                          China
            This easy, make-ahead casserole makes creative...
      2264
                                                                          Italy
            When I was in graduate school, nearly a decade...
      2265
                                                                 United Kingdom
      2266
            A coconut-milk dressing infused with garlic, g...
           Buttery and soft, tart and sweet, these muffin...
      2267
           Continent
                                                          Source (C) \
      0
                        Grain; Cooking; Restaurants; Recipes; Pasta
              Europe
      1
              Europe
                                      Recipes; Corn; Cooking; Taste
      3
              Europe
                                       Recipes; Cooking; Vegetables
      4
              Europe
                                Restaurants; Cooking; Recipes; Pork
      5
              Europe
                                  Cooking; Recipes; French language
                 . . .
      2263
                      Honey; Heat; Eggs; Recipes; Berries; Cooking
                Asia
      2264
                                                       Eggs; Recipes
              Europe
      2265
                                          Baked goods; Recipes; Tea
              Europe
      2266
                                                  Recipes; Tomatoes
      2267
                                                  Recipes; Desserts
                                                     Source (D)
      0
                                             Cardboard No More
                                                  RECIPE REDUX
      1
      3
            One Culture's Ratatouille Is Another's Fill-in...
      4
                                                     THE CHEAT
      5
                                           COOKING WITH DEXTER
            The Most Flavorful Easter Ham Starts on the Stove
      2263
      2264
            Here to Help; A Recipe For English Muffin Brea...
      2265
                                            To Steep and Slice
      2266
            Here to Help; A Recipe for Coconut Fish and To...
      2267
               Here to Help; A Recipe for Lemon Poppy Muffins
                                                     Source (E)
                                                                 Source (F)
      0
            New York Times, Late Edition (East Coast); New...
                                                                     2010.0
      1
                             New York Times Magazine; New York
                                                                     2010.0
      3
            New York Times, Late Edition (East Coast); New...
                                                                     2010.0
```

```
4
                        New York Times Magazine; New York
                                                                    2010.0
5
                        New York Times Magazine; New York
                                                                    2010.0
. . .
                                                                       . . .
      New York Times, Late Edition (East Coast); New...
2263
                                                                    2022.0
      New York Times, Late Edition (East Coast); New...
2264
                                                                   2022.0
2265
                        New York Times Magazine; New York
                                                                   2022.0
2266
      New York Times, Late Edition (East Coast); New...
                                                                   2022.0
2267
      New York Times, Late Edition (East Coast); New...
                                                                   2022.0
           Source (G)
                          WC
                               Analytic
                                          . . .
                                               Comma
                                                       Colon
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                                                                       QMark
                                                                               Exclam \
0
      New York, N.Y.
                                  93.79
                                                                0.27
                        2209
                                          . . .
                                                 7.02
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                                                                                 0.14
1
             New York
                        1334
                                  96.72
                                                 4.72
                                                        0.37
                                                                0.22
                                                                        0.00
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                                          . . .
3
      New York, N.Y.
                         774
                                  88.68
                                                 5.68
                                                        0.13
                                                                0.39
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                                                                                 0.00
                                          . . .
4
             New York
                        1485
                                  96.34
                                                 5.86
                                                        0.34
                                                                0.07
                                                                        0.07
                                                                                 0.00
5
             New York
                        1551
                                  86.54
                                                 5.48
                                                        0.26
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      New York, N.Y.
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2263
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                                                 5.73
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                                          . . .
                                  99.00
                                                 5.29
2264
      New York, N.Y.
                         378
                                          . . .
                                                        1.06
                                                                0.53
                                                                        0.00
                                                                                 0.00
2265
             New York
                        1309
                                  94.02
                                                 6.72
                                                        0.46
                                                                0.23
                                                                        0.08
                                                                                 0.00
                                          . . .
2266
      New York, N.Y.
                                  98.79
                                                 6.93
                                                        0.83
                                                                0.28
                                                                        0.00
                                                                                 0.00
                         361
                                          . . .
                                  98.58
                                                                        0.00
2267
      New York, N.Y.
                         340
                                          . . .
                                                 7.06
                                                        1.47
                                                                0.00
                                                                                 0.00
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      3.08
0
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                                           1.31
1
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3
      2.84
              0.00
                        1.29
                                  1.03
                                           0.00
4
      1.41
              0.67
                        1.28
                                  0.40
                                           0.00
5
      0.64
              2.19
                        1.55
                                  0.26
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2263
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              0.62
                                  1.11
                                           1.28
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2264 2.38
              0.00
                        0.26
                                  2.65
                                           0.00
                                  0.76
2265
      1.45
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                        1.83
                                           0.53
      2.22
2266
              0.00
                        0.28
                                  1.66
                                           0.00
2267
      0.88
              0.00
                        0.88
                                  1.76
                                           0.00
```

[2109 rows x 101 columns]

# 4.4.1 Use groupby function to produce the mean value in each quantitative column for each country

```
[86]: groupby_coun_mean_df_4 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_coun_mean_df_4 = groupby_coun_mean_df_4.drop(groupby_coun_mean_df_4.

→index[0])
groupby_coun_mean_df_4 = groupby_coun_mean_df_4.drop("Source (F)",axis=1)
groupby_coun_mean_df_4
```

[86]:		WC	Analytic	Clout	Authentic	Tone	\
	Country						
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	
	Bermuda	541.000000	90.295000	48.145000	24.885000	23.545000	
	Brazil	1744.666667	95.586667	47.893333	18.612222	38.496667	
	Bulgaria	1118.000000	96.450000	42.540000	9.800000	35.120000	
	Burma	1912.000000	94.640000	63.310000	20.990000	24.930000	
	Canada	1059.692308	95.527692	48.241538	19.528462	41.510000	
	China	1402.625000	95.066641	48.824375	18.128047	35.558750	
	Denmark	947.500000	89.425000	54.180000	10.857500	34.347500	
	Egypt	1174.250000	97.278333	55.270833	23.430833	39.959167	
	Estonia	899.000000	97.170000	60.540000	25.940000	52.920000	
	France	1526.578462	96.130708	50.012646	17.612769	41.174892	
	Georgia	2040.666667	98.043333	51.456667	18.253333	34.220000	
	Germany	1404.285714	94.748571	53.110000	15.520000	32.054286	
	Greece	1025.709677	95.969677	45.147742	15.301613	40.556452	
	Hungary	1649.250000	96.645000	46.395000	14.622500	44.110000	
	India	1725.800000	94.903600	52.015600	17.686000	31.194000	
	Indonesia	1516.500000	95.740000	46.640000	7.640000	18.345000	
	Ireland	1994.000000	89.526000	56.042000	19.410000	43.746000	
	Israel	2143.000000	87.490000	51.870000	17.530000	30.500000	
	Italy Jamaica	1384.706140 2673.000000	95.111140 95.940000	49.084649 51.050000	17.567368 17.590000	39.806184 28.260000	
		1699.535714	95.610357	50.469643	18.332143	43.664643	
	Japan Jersey	1614.125000	95.925000	47.405000	18.570000	42.515000	
	Latvia	1996.000000	97.610000	59.700000	11.290000	26.600000	
	Lebanon	1979.333333	95.763333	59.640000	14.326667	62.370000	
	Luxembourg	2394.000000	97.740000	51.840000	21.620000	47.390000	
	Malaysia	1934.500000	94.100000	48.880000	14.080000	29.370000	
	Martinique	1348.000000	92.170000	42.640000	5.820000	21.220000	
	Mexico	1447.896552	95.712069	49.854483	17.680690	42.423793	
	Morocco	1166.954545	95.141818	49.725455	18.417273	41.380909	
	Netherlands	1650.142857	94.834286	54.525000	13.259286	41.741429	
	Norway	1453.000000	95.360000	48.900000	11.630000	22.570000	
	Palestine	1909.000000	95.720000	64.710000	12.660000	54.370000	
	Peru	978.000000	96.814000	48.882000	8.342000	27.174000	
	Poland	1450.750000	91.037500	45.872500	14.687500	42.110000	
	Portugal	1766.666667	91.348333	54.671667	17.136667	46.013333	
	Russian Federation	1465.200000	95.214000	49.008000	12.566000	43.070000	
	Singapore	1710.000000	95.510000	57.875000	14.825000	52.060000	
	Spain	1180.925000	95.416250	48.128000	19.387250	38.898750	
	Sweden	2310.142857	95.510000	48.870000	15.304286	42.837143	

Switzerland	2088.461538	95.96307	7 48.57615	4 13.41153	8 37.2307	69
Syria	700.000000					
Thailand	1892.857143	95.33428	6 52.00571	4 16.93714	3 36.9671	43
Turkey	966.833333	95.60166	7 50.92500	0 11.99000	0 39.1533	33
United Kingdom	1443.647059	97.13529	4 48.98235	3 24.24235	3 37.2317	65
Vietnam	2016.166667	95.03333	3 55.10000	0 16.22500	0 42.9816	67
	WPS	Sixltr	Dic	function	pronoun	\
Country						
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	

Peru	12.648000	17.694000	64.694000	35.8940	00 2.342000 .
Poland	15.837500	17.127500			
Portugal	13.598333	19.120000			
Russian Federation	12.856000	18.190000			
Singapore	16.845000	19.620000			
Spain	14.534250	18.534500			
Sweden	13.571429	19.244286			
Switzerland	14.965385	18.973077			
Syria	14.580000	21.430000			
Thailand	15.767143	19.845714			
Turkey	13.855000	19.630000			
United Kingdom	13.719412	17.574118			
Vietnam	15.136667	19.066667			
0 0 11 0 111	101120001		0000000	0,72000	
	Comma	Colon	SemiC	QMark	Exclam \
Country				•	,
Afghanistan	7.600000	0.290000	0.140000 0	.000000	0.00000
Argentina	6.660000	0.700000	0.190000 0	.000000	0.00000
Armenia	6.210000				0.00000
Austria	5.333333				0.00000
Barbados	5.840000				0.00000
Belgium	5.490000				0.00000
Bermuda	4.840000				0.00000
Brazil	6.341111				0.011111
Bulgaria	5.460000				0.00000
Burma	6.540000				0.050000
Canada	4.960769				0.00000
China	5.492500				0.002812
Denmark	6.440000	0.605000	0.015000 0		0.00000
Egypt	5.274167				0.00000
Estonia	5.780000	0.330000	0.110000 0		0.00000
France	5.226800				0.004154
Georgia	5.560000				0.016667
Germany	4.552857	0.454286	0.184286 0	.085714	0.00000
Greece	5.346129	0.605161	0.123871 0	.000000	0.00000
Hungary	4.495000	0.487500	0.235000 0	.000000	0.00000
India	6.070800	0.469200	0.136800 0	.014400	0.006000
Indonesia	6.570000	0.375000	0.180000 0	.000000	0.00000
Ireland	5.504000	0.800000	0.210000 0		0.00000
Israel	6.350000	0.470000	0.050000 0	.000000	0.00000
Italy	5.460132	0.601667	0.125175 0	.030044	0.004868
Jamaica	8.190000				0.00000
Japan	5.297500	0.683214	0.130000 0	.017500	0.004643
Jersey	7.520000				0.00000
Latvia	7.520000				0.00000
Lebanon	6.520000				0.026667
Luxembourg	5.680000				0.00000
0					

Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
Syria	5.000000	0.290000	0.000000	0.140000	0.000000
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
	Dash	Quote	Apostro	Parenth	OtherP
Country			_		
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
Georgia	0.943333	0.000000	1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000

```
Italy
                   1.134518
                             0.004561 1.355307
                                                0.780746 1.277851
Jamaica
                   1.270000
                             0.000000
                                      1.420000
                                                1.720000 2.920000
Japan
                   1.207857
                             0.000000 1.271429
                                                0.810000 1.641071
Jersey
                   0.841250
                             0.000000 1.142500
                                                1.323750 3.186250
Latvia
                             0.000000 5.760000
                                                0.200000 2.710000
                   1.500000
Lebanon
                   1.040000
                             0.000000
                                      1.510000
                                                0.690000 1.386667
Luxembourg
                   2.800000
                             0.000000
                                      2.300000
                                                0.630000 1.040000
Malaysia
                   1.375000
                             0.000000 1.440000
                                                0.530000 4.075000
Martinique
                   1.410000
                             0.000000 0.300000 0.590000 6.080000
Mexico
                   1.539828
                             0.001552
                                      1.297759
                                                0.895690 1.517241
Morocco
                   0.961364
                             0.000000 0.535455
                                                0.841364 1.594545
Netherlands
                             0.000000 2.865000
                                                0.672857 1.208571
                   1.603571
Norway
                   0.760000
                             0.000000 0.140000
                                                2.060000 1.650000
Palestine
                   1.520000
                             0.000000
                                      3.820000
                                                0.840000 0.470000
Peru
                             0.000000
                                      0.572000
                                                0.368000 0.656000
                   1.168000
Poland
                   1.010000
                             0.000000
                                      2.065000
                                                0.880000 0.865000
Portugal
                             0.028333 4.128333
                                                0.825000 1.115000
                   1.391667
Russian Federation
                   1.280000
                             0.000000
                                      1.440000
                                                1.126000 1.060000
Singapore
                   1.110000
                             0.000000
                                      2.310000
                                                0.235000 0.760000
Spain
                             0.002000 1.062000
                                                0.897000 1.733500
                   1.196750
Sweden
                   1.035714
                             0.004286
                                      2.001429
                                                1.207143 1.084286
                                                0.756923 1.960769
Switzerland
                   1.075385
                             0.003846 1.330769
                             0.000000 3.000000 0.860000 0.430000
Syria
                   2.570000
Thailand
                   1.134286
                             0.000000 2.298571
                                                1.081429 1.437143
Turkey
                   1.031667
                             0.000000
                                      1.600000
                                                0.430000 0.946667
United Kingdom
                   0.970000
                             0.000000
                                      1.460000
                                                0.935294 1.944118
Vietnam
                   1.126667
                             0.000000
                                      2.645000 1.141667
                                                         1.460000
```

[51 rows x 93 columns]

# 4.4.2 Use groupby function to produce the mean value in each quantitative column for each continent

\

```
[87]: groupby_con_mean_df_4 = df1_liwc.groupby("Country").mean(numeric_only=True)
groupby_con_mean_df_4 = groupby_con_mean_df_4.drop(groupby_con_mean_df_4.

→index[0])
groupby_con_mean_df_4 = groupby_con_mean_df_4.drop("Source (F)",axis=1)
groupby_con_mean_df_4
```

[87]:		WC	Analytic	Clout	Authentic	Tone	١
	Country						
	Afghanistan	2078.000000	94.380000	58.740000	18.370000	29.800000	
	Argentina	2567.000000	98.110000	52.030000	14.780000	27.710000	
	Armenia	4330.000000	93.470000	43.940000	24.620000	31.270000	
	Austria	1194.083333	95.870000	56.314167	14.162500	42.167500	
	Barbados	685.000000	88.370000	36.290000	25.670000	15.500000	
	Belgium	833.142857	97.494286	47.518571	20.001429	31.001429	

```
Bermuda
                      541.000000
                                  90.295000
                                              48.145000
                                                         24.885000
                                                                     23.545000
Brazil
                     1744.666667
                                  95.586667
                                              47.893333
                                                         18.612222
                                                                     38.496667
Bulgaria
                     1118.000000
                                  96.450000
                                              42.540000
                                                          9.800000
                                                                     35.120000
Burma
                     1912.000000
                                  94.640000
                                              63.310000
                                                         20.990000
                                                                     24.930000
Canada
                     1059.692308
                                  95.527692
                                              48.241538
                                                         19.528462
                                                                     41.510000
China
                     1402.625000
                                  95.066641
                                              48.824375
                                                         18.128047
                                                                     35.558750
Denmark
                      947.500000
                                  89.425000
                                              54.180000
                                                         10.857500
                                                                     34.347500
Egypt
                     1174.250000
                                  97.278333
                                              55.270833
                                                         23.430833
                                                                     39.959167
Estonia
                      899.000000
                                  97.170000
                                              60.540000
                                                         25.940000
                                                                     52.920000
France
                                  96.130708
                     1526.578462
                                              50.012646
                                                         17.612769
                                                                     41.174892
Georgia
                     2040.666667
                                  98.043333
                                              51.456667
                                                         18.253333
                                                                     34.220000
Germany
                     1404.285714
                                  94.748571
                                              53.110000
                                                         15.520000
                                                                     32.054286
Greece
                     1025.709677
                                  95.969677
                                              45.147742
                                                         15.301613
                                                                     40.556452
Hungary
                     1649.250000
                                  96.645000
                                              46.395000
                                                         14.622500
                                                                     44.110000
India
                     1725.800000
                                  94.903600
                                              52.015600
                                                         17.686000
                                                                     31.194000
Indonesia
                     1516.500000
                                  95.740000
                                              46.640000
                                                          7.640000
                                                                     18.345000
Ireland
                     1994.000000
                                  89.526000
                                              56.042000
                                                                     43.746000
                                                         19.410000
Israel
                     2143.000000
                                  87.490000
                                              51.870000
                                                         17.530000
                                                                     30.500000
Italy
                     1384.706140
                                  95.111140
                                              49.084649
                                                         17.567368
                                                                     39.806184
Jamaica
                     2673.000000
                                  95.940000
                                              51.050000
                                                         17.590000
                                                                     28.260000
Japan
                     1699.535714
                                  95.610357
                                              50.469643
                                                         18.332143
                                                                     43.664643
                                              47.405000
Jersey
                     1614.125000
                                  95.925000
                                                         18.570000
                                                                     42.515000
Latvia
                                  97.610000
                                              59.700000
                                                         11.290000
                     1996.000000
                                                                     26.600000
Lebanon
                     1979.333333
                                  95.763333
                                              59.640000
                                                         14.326667
                                                                     62.370000
Luxembourg
                                              51.840000
                                                                     47.390000
                     2394.000000
                                  97.740000
                                                         21.620000
Malaysia
                     1934.500000
                                  94.100000
                                              48.880000
                                                         14.080000
                                                                     29.370000
Martinique
                     1348.000000
                                  92.170000
                                              42.640000
                                                          5.820000
                                                                     21.220000
Mexico
                     1447.896552
                                  95.712069
                                              49.854483
                                                         17.680690
                                                                     42.423793
Morocco
                     1166.954545
                                  95.141818
                                              49.725455
                                                         18.417273
                                                                     41.380909
Netherlands
                     1650.142857
                                  94.834286
                                              54.525000
                                                         13.259286
                                                                     41.741429
                                  95.360000
Norway
                     1453.000000
                                              48.900000
                                                         11.630000
                                                                     22.570000
Palestine
                     1909.000000
                                  95.720000
                                              64.710000
                                                         12.660000
                                                                     54.370000
Peru
                      978.000000
                                  96.814000
                                              48.882000
                                                          8.342000
                                                                     27.174000
Poland
                     1450.750000
                                  91.037500
                                              45.872500
                                                         14.687500
                                                                     42.110000
Portugal
                     1766.666667
                                  91.348333
                                              54.671667
                                                         17.136667
                                                                     46.013333
Russian Federation
                    1465.200000
                                  95.214000
                                              49.008000
                                                         12.566000
                                                                     43.070000
Singapore
                     1710.000000
                                  95.510000
                                              57.875000
                                                         14.825000
                                                                     52.060000
Spain
                                  95.416250
                                              48.128000
                     1180.925000
                                                         19.387250
                                                                     38.898750
Sweden
                     2310.142857
                                  95.510000
                                              48.870000
                                                         15.304286
                                                                     42.837143
Switzerland
                     2088.461538
                                  95.963077
                                              48.576154
                                                         13.411538
                                                                     37.230769
Syria
                      700.000000
                                  97.730000
                                              56.250000
                                                         27.590000
                                                                     55.390000
Thailand
                     1892.857143
                                  95.334286
                                              52.005714
                                                         16.937143
                                                                     36.967143
                                              50.925000
Turkey
                      966.833333
                                  95.601667
                                                         11.990000
                                                                     39.153333
United Kingdom
                     1443.647059
                                  97.135294
                                              48.982353
                                                         24.242353
                                                                     37.231765
                                              55.100000
                                                         16.225000
Vietnam
                     2016.166667
                                  95.033333
                                                                     42.981667
```

Dic

function

pronoun

Sixltr

WPS

Country						
Afghanistan	12.440000	18.000000	68.910000	34.840000	4.760000	
Argentina	14.030000	18.970000	63.460000	34.980000	2.690000	
Armenia	14.680000	18.500000	71.060000	38.240000	3.720000	
Austria	14.876667	19.186667	69.585000	37.369167	4.441667	
Barbados	11.420000	20.290000	71.390000	37.960000	5.840000	
Belgium	15.167143	21.214286	63.952857	33.472857	2.134286	
Bermuda	11.070000	14.635000	71.800000	41.750000	6.170000	
Brazil	14.442222	19.094444	67.278889	38.577778	3.870000	
Bulgaria	12.150000	20.660000	65.470000	38.100000	3.130000	
Burma	17.700000	18.360000	66.740000	36.040000	4.500000	
Canada	14.713077	17.750769	68.160769	38.068462	3.740000	
China	14.150937	19.131484	66.323203	36.076797	3.350234	
Denmark	12.790000	17.910000	73.430000	40.722500	6.890000	
Egypt	13.406667	19.245000	69.165833	36.812500	2.771667	
Estonia	18.350000	22.910000	69.190000	37.820000	4.340000	
France	14.303323	18.144246	68.253969	38.043754	3.987077	
Georgia	15.933333	19.453333	64.723333	35.946667	2.813333	
Germany	12.870000	18.097143	66.775714	37.560000	3.694286	
Greece	14.264839	18.810968	64.129355	35.644839	2.827097	
Hungary	13.915000	19.265000	64.307500	33.332500	1.610000	
India	15.218800	18.877600	67.590000	36.448000	4.284800	
Indonesia	11.835000	18.295000	61.005000	31.665000	2.320000	
Ireland	14.110000	19.476000	70.716000	38.912000	5.728000	
Israel	15.420000	18.760000	67.570000	37.840000	4.810000	
Italy	14.467588	18.800351	67.673289	37.624079	3.768904	
Jamaica	17.130000	22.630000	63.370000	33.600000	2.280000	
Japan	14.178571	19.909286	65.258571	36.512857	3.327143	• • •
Jersey	16.186250	20.435000	65.820000	35.992500	2.697500	• • •
Latvia	13.770000	17.030000	70.940000	39.280000	4.610000	• • •
Lebanon	17.886667	19.320000	69.653333	38.993333	4.616667	• • •
Luxembourg	18.420000	15.080000	67.540000	37.760000	2.550000	• • •
Malaysia	11.365000	19.785000	65.610000	33.875000	2.765000	
Martinique	15.860000	17.580000	61.200000	32.640000	2.970000	• • •
Mexico	14.475517	19.086724	66.820172	37.476552	4.035690	• • •
Morocco	15.092727	19.106364	67.562273	39.191364	4.010000	• • •
Netherlands	15.422143	19.239286	66.140714	36.776429	4.399286	• • •
Norway	18.390000	18.860000	66.690000	36.340000	2.960000	• • •
Palestine	19.680000	22.470000	68.100000	38.340000	5.190000	• • •
Peru	12.648000	17.694000	64.694000	35.894000	2.342000	• • •
Poland	15.837500	17.127500	69.510000	37.850000	5.610000	• • •
Portugal	13.598333	19.120000	70.511667	39.573333	6.020000	• • •
Russian Federation	12.856000	18.190000	65.362000	35.560000	3.202000	• • •
Singapore	16.845000	19.620000	71.405000	37.830000	3.595000	• • •
Spain	14.534250	18.534500	68.586500	38.346250	3.595000	• • •
Sweden	13.571429	19.244286	65.941429	34.744286	3.494286	• • •
Switzerland	14.965385	18.973077	67.793846	37.250769	3.877692	• • •

Syria	14.580000	21.430000	72.8600	00 38.710	000 3.290000
Thailand	15.767143	19.845714	67.1057	14 36.8028	357 4.047143
Turkey	13.855000	19.630000	65.3500	00 36.353	333 3.866667
United Kingdom	13.719412	17.574118	8 68.7576	47 38.4076	647 4.081765
Vietnam	15.136667	19.066667	67.5900	00 37.188	333 4.503333
	Comma	Colon	SemiC	QMark	Exclam \
Country					
Afghanistan	7.600000	0.290000	0.140000	0.000000	0.000000
Argentina	6.660000	0.700000	0.190000	0.000000	0.000000
Armenia	6.210000	0.300000	0.050000	0.000000	0.000000
Austria	5.333333	0.831667	0.085000	0.071667	0.000000
Barbados	5.840000	0.290000	0.150000	0.000000	0.000000
Belgium	5.490000	0.390000	0.255714	0.000000	0.000000
Bermuda	4.840000	0.505000	0.235000	0.305000	0.000000
Brazil	6.341111	0.320000	0.076667	0.032222	0.011111
Bulgaria	5.460000	0.540000	0.090000	0.000000	0.000000
Burma	6.540000	1.150000	0.210000	0.000000	0.050000
Canada	4.960769	0.364615	0.065385	0.000000	0.000000
China	5.492500	0.581406	0.168281	0.035469	0.002812
Denmark	6.440000	0.605000	0.015000	0.132500	0.000000
Egypt	5.274167	0.928333	0.063333	0.011667	0.000000
Estonia	5.780000	0.330000	0.110000	0.110000	0.000000
France	5.226800	0.526092	0.117200	0.035785	0.004154
Georgia	5.560000	0.356667	0.086667	0.013333	0.016667
Germany	4.552857	0.454286	0.184286	0.085714	0.000000
Greece	5.346129	0.605161	0.123871	0.000000	0.000000
Hungary	4.495000	0.487500	0.235000	0.000000	0.000000
India	6.070800	0.469200	0.136800	0.014400	0.006000
Indonesia	6.570000	0.375000	0.180000	0.000000	0.000000
Ireland	5.504000	0.800000	0.210000	0.332000	0.000000
Israel	6.350000	0.470000	0.050000	0.000000	0.000000
Italy	5.460132	0.601667	0.125175	0.030044	0.004868
Jamaica	8.190000	0.340000	0.040000	0.000000	0.000000
Japan	5.297500	0.683214	0.130000	0.017500	0.004643
Jersey	7.520000	0.372500	0.068750	0.018750	0.000000
Latvia	7.520000	0.350000	0.100000	0.000000	0.000000
Lebanon	6.520000	0.356667	0.273333	0.000000	0.026667
Luxembourg	5.680000	0.330000	0.080000	0.000000	0.000000
Malaysia	6.370000	0.500000	0.225000	0.000000	0.000000
Martinique	6.380000	0.370000	0.070000	0.000000	0.070000
Mexico	5.269828	0.732931	0.070690	0.018621	0.000690
Morocco	5.594091	0.416818	0.122727	0.046364	0.000000
Netherlands	5.844286	0.502143	0.118571	0.024286	0.005000
Norway	5.640000	0.960000	0.210000	0.000000	0.000000
Palestine	6.760000	0.470000	0.100000	0.050000	0.000000
Peru	5.628000	0.550000	0.026000	0.000000	0.000000
	3.02000	2.00000	3.02000	3.00000	

Poland	6.007500	0.367500	0.185000	0.000000	0.000000
Portugal	5.743333	0.453333	0.168333	0.145000	0.008333
Russian Federation	5.958000	0.448000	0.224000	0.022000	0.022000
Singapore	6.780000	0.405000	0.000000	0.060000	0.000000
Spain	5.324750	0.392750	0.083000	0.031750	0.007750
Sweden	5.931429	0.625714	0.152857	0.037143	0.005714
Switzerland	5.867692	0.467692	0.096923	0.070769	0.000000
	5.000000	0.407032	0.000000	0.140000	0.000000
Syria					
Thailand	5.794286	0.565714	0.211429	0.077143	0.040000
Turkey	4.913333	0.581667	0.133333	0.121667	0.000000
United Kingdom	5.108824	0.452941	0.053529	0.061765	0.002353
Vietnam	5.863333	0.386667	0.068333	0.000000	0.015000
	Dash	Quote	Apostro	Parenth	OtherP
Country					
Afghanistan	0.670000	0.000000	3.080000	1.250000	3.220000
Argentina	1.440000	0.000000	0.580000	1.360000	0.660000
Armenia	2.240000	0.000000	0.600000	0.690000	0.650000
Austria	1.309167	0.039167	2.800833	1.332500	0.953333
Barbados	0.880000	0.000000	0.000000	0.290000	0.730000
Belgium	1.162857	0.000000	0.217143	0.670000	1.964286
Bermuda	1.445000	0.000000	0.350000	0.775000	0.545000
Brazil	1.264444	0.000000	1.458889	0.745556	1.073333
Bulgaria	0.810000	0.000000	0.450000	1.070000	1.430000
Burma	1.050000	0.000000	3.970000	1.360000	1.150000
Canada	1.200000	0.000000	0.932308	0.683846	1.009231
China	1.173516	0.009297	1.010859	0.712422	2.026562
Denmark	0.870000	0.000000	4.015000	0.282500	0.590000
Egypt	1.274167	0.000000	0.762500	0.153333	0.992500
Estonia	8.450000	0.000000	1.220000	2.000000	1.000000
France	1.153569	0.004892	1.444185	0.876677	1.249108
Georgia	0.943333	0.000000	1.450000	0.526667	2.063333
Germany	1.372857	0.004286	1.282857	0.301429	3.200000
Greece	1.011613	0.006452	0.725161	0.410968	1.102581
Hungary	0.982500	0.000000	0.560000	0.612500	2.255000
India	1.351600	0.000000	1.991200	0.691200	2.030400
Indonesia	1.430000	0.030000	0.665000	1.780000	1.580000
Ireland	1.330000	0.000000	3.254000	0.616000	1.206000
Israel	1.070000	0.000000	3.450000	0.930000	1.260000
Italy	1.134518	0.004561	1.355307	0.780746	1.277851
Jamaica		0.000000	1.420000	1.720000	
	1.270000				2.920000
Japan	1.207857	0.000000	1.271429	0.810000	1.641071
Jersey	0.841250	0.000000	1.142500	1.323750	3.186250
Latvia	1.500000	0.000000	5.760000	0.200000	2.710000
Lebanon	1.040000	0.000000	1.510000	0.690000	1.386667
Luxembourg	2.800000	0.000000	2.300000	0.630000	1.040000
Malaysia	1.375000	0.000000	1.440000	0.530000	4.075000

```
Martinique
                    1.410000
                             0.000000
                                       0.300000
                                                 0.590000
                                                           6.080000
Mexico
                             0.001552
                                       1.297759
                                                 0.895690
                                                           1.517241
                    1.539828
Morocco
                    0.961364
                             0.000000
                                       0.535455
                                                 0.841364 1.594545
Netherlands
                    1.603571
                             0.000000
                                       2.865000
                                                 0.672857
                                                           1.208571
                             0.000000
                                       0.140000
                                                 2.060000 1.650000
Norway
                    0.760000
Palestine
                    1.520000
                             0.000000
                                       3.820000
                                                 0.840000
                                                           0.470000
Peru
                    1.168000
                             0.000000
                                       0.572000
                                                 0.368000
                                                           0.656000
Poland
                    1.010000
                             0.000000
                                       2.065000
                                                 0.880000
                                                           0.865000
Portugal
                    1.391667
                             0.028333
                                       4.128333
                                                 0.825000
                                                           1.115000
Russian Federation
                                       1.440000
                   1.280000
                             0.000000
                                                 1.126000 1.060000
Singapore
                    1.110000
                             0.000000
                                       2.310000
                                                 0.235000
                                                           0.760000
Spain
                    1.196750
                             0.002000
                                       1.062000
                                                 0.897000
                                                           1.733500
                             0.004286
Sweden
                    1.035714
                                       2.001429
                                                 1.207143 1.084286
Switzerland
                    1.075385
                             0.003846
                                       1.330769
                                                 0.756923 1.960769
Syria
                    2.570000
                             0.000000
                                       3.000000
                                                 0.860000 0.430000
Thailand
                    1.134286
                             0.000000
                                       2.298571
                                                 1.081429
                                                           1.437143
Turkey
                              0.000000
                                       1.600000
                                                 0.430000
                                                           0.946667
                    1.031667
United Kingdom
                                       1.460000
                    0.970000
                             0.000000
                                                 0.935294
                                                           1.944118
Vietnam
                    1.126667
                             0.000000
                                       2.645000
                                                 1.141667
                                                           1.460000
```

[51 rows x 93 columns]

### 4.4.3 Show only the columns of "Affective processes" and its sub-codes

[88]:	<pre>groupby_coun_mean_df_4[['affect','posemo', 'negemo', 'anx', 'anger', 'sad']]</pre>									
[88]:		affect	posemo	negemo	anx	anger	sad			
	Country									
	Afghanistan	2.940000	1.590000	1.350000	0.000000	0.430000	0.140000			
	Argentina	1.600000	0.860000	0.740000	0.040000	0.350000	0.040000			
	Armenia	3.280000	1.800000	1.480000	0.050000	0.760000	0.180000			
	Austria	2.810833	1.855833	0.956667	0.012500	0.585000	0.274167			
	Barbados	2.920000	1.020000	1.750000	0.290000	0.440000	0.00000			
	Belgium	2.187143	1.200000	0.984286	0.230000	0.405714	0.057143			
	Bermuda	2.775000	1.305000	1.470000	0.150000	0.230000	0.120000			
	Brazil	2.767778	1.716667	1.013333	0.087778	0.233333	0.237778			
	Bulgaria	1.610000	1.070000	0.540000	0.090000	0.090000	0.090000			
	Burma	2.040000	0.990000	1.050000	0.050000	0.680000	0.260000			
	Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769			
	China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094			
	Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500			
	Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167			
	Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.000000			
	France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200			
	Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333			
	Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714			
	Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226			

```
Hungary
                           2.382500
                                     1.687500
                                               0.695000
                                                          0.055000
                                                                    0.220000
                                                                               0.075000
                                                          0.052000
      India
                           2.718000
                                     1.474000
                                               1.182400
                                                                    0.644000
                                                                               0.184800
      Indonesia
                           3.265000
                                     1.345000
                                               1.925000
                                                          0.030000
                                                                    1.015000
                                                                               0.075000
      Ireland
                           3.080000
                                     2.024000
                                               1.044000
                                                          0.100000
                                                                    0.448000
                                                                               0.148000
      Israel
                           2.150000
                                     1.210000
                                               0.930000
                                                          0.090000
                                                                    0.470000
                                                                               0.190000
      Italy
                           2.634868
                                     1.678465
                                               0.923816
                                                          0.087325
                                                                    0.358465
                                                                               0.176316
      Jamaica
                                     1.350000
                                               1.200000
                                                          0.070000
                                                                    0.670000
                           2.580000
                                                                               0.150000
      Japan
                           2.291071
                                     1.596071
                                               0.636786
                                                          0.069286
                                                                    0.279643
                                                                               0.110357
      Jersey
                           2.957500
                                     1.933750
                                               1.016250
                                                          0.042500
                                                                    0.577500
                                                                               0.257500
      Latvia
                                     1.200000
                                               1.150000
                                                          0.000000
                                                                    0.350000
                           2.350000
                                                                               0.200000
      Lebanon
                                                                    0.173333
                           3.223333
                                     2.590000
                                               0.616667
                                                          0.156667
                                                                               0.073333
      Luxembourg
                           2.420000
                                     1.800000
                                               0.630000
                                                          0.000000
                                                                    0.290000
                                                                               0.080000
      Malaysia
                           2.945000
                                     1.515000
                                               1.335000
                                                          0.210000
                                                                    0.525000
                                                                               0.060000
      Martinique
                           2.970000
                                     1.340000
                                               1.630000
                                                          0.150000
                                                                    0.890000
                                                                               0.070000
      Mexico
                           2.617414
                                     1.745690
                                               0.846034
                                                          0.087069
                                                                    0.329655
                                                                               0.134828
      Morocco
                           2.416364
                                     1.610000
                                               0.776818
                                                          0.010909
                                                                    0.361818
                                                                               0.148636
      Netherlands
                           2.738571
                                     1.794286
                                               0.925714
                                                          0.058571
                                                                    0.427143
                                                                               0.155000
                                     1.510000
                                               1.720000
                                                          0.000000
                                                                    0.690000
      Norway
                           3.230000
                                                                               0.140000
      Palestine
                           3.090000
                                     2.300000
                                               0.790000
                                                          0.050000
                                                                    0.370000
                                                                               0.050000
      Peru
                           2.462000
                                     1.260000
                                               1.194000
                                                          0.026000
                                                                    0.480000
                                                                               0.158000
      Poland
                           2.607500
                                     1.732500
                                               0.840000
                                                          0.060000
                                                                    0.370000
                                                                               0.150000
                                     2.103333
                                               1.015000
                                                          0.030000
                                                                    0.345000
      Portugal
                           3.133333
                                                                               0.286667
      Russian Federation
                          2.674000
                                     1.790000
                                               0.846000
                                                          0.036000
                                                                    0.298000
                                                                               0.108000
                                                                    0.615000
      Singapore
                           3.565000
                                     2.485000
                                               1.085000
                                                          0.000000
                                                                               0.060000
      Spain
                                     1.636500
                                               0.931000
                                                                    0.406000
                                                                               0.163000
                           2.604250
                                                          0.099750
      Sweden
                           2.962857
                                     1.934286
                                               1.000000
                                                          0.190000
                                                                    0.384286
                                                                               0.140000
                                               1.144615
      Switzerland
                           3.032308
                                     1.784615
                                                          0.147692
                                                                    0.468462
                                                                               0.145385
      Syria
                                     2.570000
                                               1.000000
                                                                    0.290000
                           3.570000
                                                          0.140000
                                                                               0.290000
                           2.557143
      Thailand
                                     1.511429
                                               0.922857
                                                          0.057143
                                                                    0.372857
                                                                               0.048571
                                               0.793333
                                                                    0.420000
      Turkey
                           2.328333
                                     1.535000
                                                          0.130000
                                                                               0.125000
      United Kingdom
                                               1.206471
                                                                    0.408824
                           3.079412
                                     1.823529
                                                          0.077647
                                                                               0.241765
      Vietnam
                           2.860000
                                     1.853333
                                               0.926667
                                                          0.068333
                                                                    0.368333
                                                                               0.120000
[89]:
      groupby_con_mean_df_4[['affect','posemo', 'negemo', 'anx',
                                                                   'anger',
                                                                             'sad']]
[89]:
                             affect
                                       posemo
                                                 negemo
                                                                       anger
                                                                                    sad
                                                               anx
      Country
                                                          0.000000
                                                                    0.430000
                                                                               0.140000
      Afghanistan
                           2.940000
                                     1.590000
                                               1.350000
                                     0.860000
                                                          0.040000
                                                                    0.350000
                                                                               0.040000
      Argentina
                           1.600000
                                               0.740000
      Armenia
                           3.280000
                                     1.800000
                                               1.480000
                                                          0.050000
                                                                    0.760000
                                                                               0.180000
      Austria
                           2.810833
                                     1.855833
                                               0.956667
                                                          0.012500
                                                                    0.585000
                                                                               0.274167
      Barbados
                           2.920000
                                     1.020000
                                               1.750000
                                                          0.290000
                                                                    0.440000
                                                                               0.000000
      Belgium
                           2.187143
                                     1.200000
                                               0.984286
                                                          0.230000
                                                                    0.405714
                                                                               0.057143
      Bermuda
                           2.775000
                                     1.305000
                                               1.470000
                                                          0.150000
                                                                    0.230000
                                                                               0.120000
      Brazil
                           2.767778
                                     1.716667
                                               1.013333
                                                          0.087778
                                                                    0.233333
                                                                               0.237778
      Bulgaria
                                     1.070000
                                               0.540000
                                                          0.090000
                                                                    0.090000
                                                                               0.090000
                           1.610000
```

1.050000

0.050000

0.680000

0.260000

0.990000

2.040000

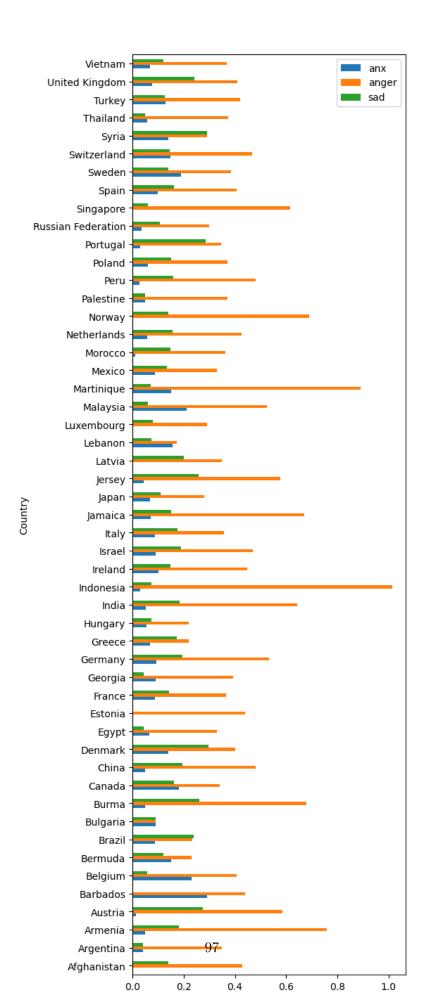
Burma

Canada	2.911538	1.883077	1.023077	0.181538	0.341538	0.160769
China	2.635078	1.560156	1.043281	0.049766	0.481250	0.196094
Denmark	3.295000	1.862500	1.370000	0.140000	0.402500	0.297500
Egypt	2.270000	1.510000	0.730833	0.065833	0.330000	0.044167
Estonia	2.780000	2.110000	0.670000	0.000000	0.440000	0.000000
France	2.739415	1.757415	0.928062	0.086862	0.365077	0.143200
Georgia	2.493333	1.416667	0.966667	0.090000	0.393333	0.043333
Germany	2.295714	1.312857	0.982857	0.092857	0.534286	0.195714
Greece	2.128387	1.460323	0.653871	0.069355	0.220323	0.173226
Hungary	2.382500	1.687500	0.695000	0.055000	0.220000	0.075000
India	2.718000	1.474000	1.182400	0.052000	0.644000	0.184800
Indonesia	3.265000	1.345000	1.925000	0.030000	1.015000	0.075000
Ireland	3.080000	2.024000	1.044000	0.100000	0.448000	0.148000
Israel	2.150000	1.210000	0.930000	0.090000	0.470000	0.190000
Italy	2.634868	1.678465	0.923816	0.087325	0.358465	0.176316
Jamaica	2.580000	1.350000	1.200000	0.070000	0.670000	0.150000
Japan	2.291071	1.596071	0.636786	0.069286	0.279643	0.110357
Jersey	2.957500	1.933750	1.016250	0.042500	0.577500	0.257500
Latvia	2.350000	1.200000	1.150000	0.000000	0.350000	0.200000
Lebanon	3.223333	2.590000	0.616667	0.156667	0.173333	0.073333
Luxembourg	2.420000	1.800000	0.630000	0.000000	0.290000	0.080000
Malaysia	2.945000	1.515000	1.335000	0.210000	0.525000	0.060000
Martinique	2.970000	1.340000	1.630000	0.150000	0.890000	0.070000
Mexico	2.617414	1.745690	0.846034	0.087069	0.329655	0.134828
Morocco	2.416364	1.610000	0.776818	0.010909	0.361818	0.148636
Netherlands	2.738571	1.794286	0.925714	0.058571	0.427143	0.155000
Norway	3.230000	1.510000	1.720000	0.000000	0.690000	0.140000
Palestine	3.090000	2.300000	0.790000	0.050000	0.370000	0.050000
Peru	2.462000	1.260000	1.194000	0.026000	0.480000	0.158000
Poland	2.607500	1.732500	0.840000	0.060000	0.370000	0.150000
Portugal	3.133333	2.103333	1.015000	0.030000	0.345000	0.286667
Russian Federation	2.674000	1.790000	0.846000	0.036000	0.298000	0.108000
Singapore	3.565000	2.485000	1.085000	0.000000	0.615000	0.060000
Spain	2.604250	1.636500	0.931000	0.099750	0.406000	0.163000
Sweden	2.962857	1.934286	1.000000	0.190000	0.384286	0.140000
Switzerland	3.032308	1.784615	1.144615	0.147692	0.468462	0.145385
Syria	3.570000	2.570000	1.000000	0.140000	0.290000	0.290000
Thailand	2.557143	1.511429	0.922857	0.057143	0.372857	0.048571
Turkey	2.328333	1.535000	0.793333	0.130000	0.420000	0.125000
United Kingdom	3.079412	1.823529	1.206471	0.077647	0.408824	0.241765
Vietnam	2.860000	1.853333	0.926667	0.068333	0.368333	0.120000

# 4.4.4 Compare negative emotions for each country

```
[90]: plt.rcParams["figure.figsize"] = (5,17) groupby_coun_mean_df_4[['anx', 'anger', 'sad']].plot.barh()
```

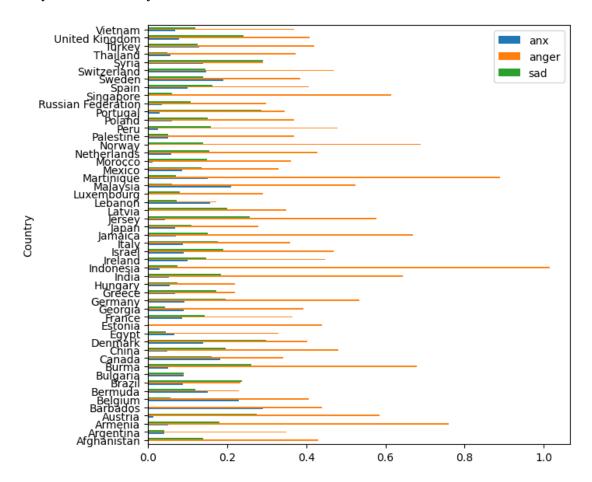
[90]: <Axes: ylabel='Country'>



## 4.4.5 Compare negative emotions for each continent

```
[91]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_4[['anx','anger','sad']].plot.barh()
```

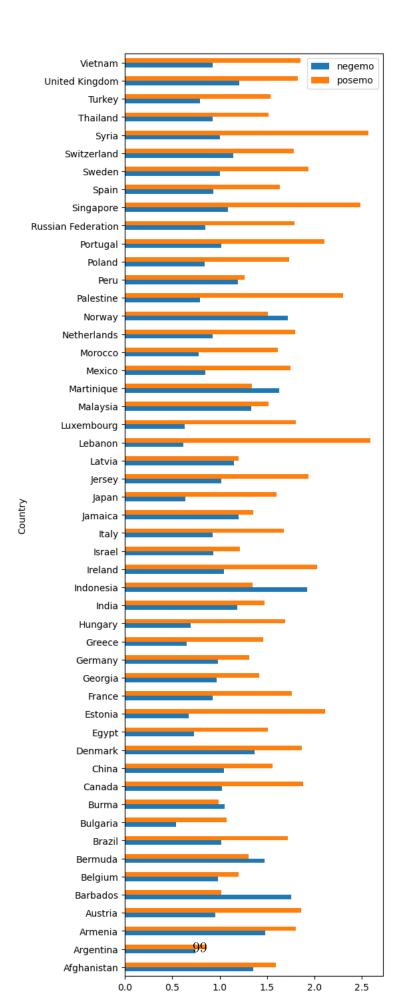
[91]: <Axes: ylabel='Country'>



### 4.4.6 Compare positive end negative emotions in each country

```
[92]: plt.rcParams["figure.figsize"] = (5,18)
groupby_coun_mean_df_4[['negemo','posemo']].plot.barh()
```

[92]: <Axes: ylabel='Country'>



## 4.4.7 Compare positive end negative emotions in each continent

```
[93]: plt.rcParams["figure.figsize"] = (7,7)
groupby_con_mean_df_4[['negemo','posemo']].plot.barh()
```

[93]: <Axes: ylabel='Country'>

