

Programming
Summer 2020

Exercises

Number 06, Submission Deadline: June 2, 2020

1. Demographics of Germany (7P)

Use the demographic data set of the lecture to answer the following questions by grouping / agglomerating the data:

1. How many women aged 60 years and older live in the federal states Nordrhein-Westfalen, Bayern, and Baden-Wuerttemberg altogether? (2P)
2. List the relative population (in percentage) of 0-21 year-olds of all federal states. Which state contributes most? Is this also the state with the highest overall population? (3P)
3. Which federal state has the *relatively* biggest fraction of female population? (2P)

```
[19]: import pandas as pd

demogrphx = pd.read_table('course_material_06/12111-04-01-4-B_processed3.tsv',
                          index_col = [0, 1], header=[0, 1])
demogrphx
```

```
[19]:
```

		Population		
		Male	Female	Total
FederalState	Age			
Schleswig-Holstein	0	11132	10400	21532
	1	11504	10360	21864
	2	11733	11067	22800
	3	12214	11147	23361
	4	12142	10945	23087
...	
Thueringen	96	149	599	748
	97	75	476	551
	98	47	275	322
	99	30	181	211
	100	32	248	280

```
[1616 rows x 3 columns]
```

2. Employment in Germany (6P)

The following data is a minimally processed data set of employment rates from the same census in Germany. It contains the following columns (from left to right):

- Bundesland (federal state)

- Altersgruppe (age group)
- Bevoelkerung nach Erwerbsstatus (population by employment status)
- Erwerbspersonen (working population)
- Erwerbstaetige [Insgesamt/maennlich/weiblich] (Employed people [total/male/female])
- Erwerbslose [Insgesamt/maennlich/weiblich] (Unemployed people [total/male/female])
- Nichterwerbspersonen [Insgesamt/maennlich/weiblich] (non-working population [total/-male/female])

```
[18]: employment_data = pd.read_csv('course_material_06/12111-12-01-4-B_processed.
    →tsv',
                                     header=[0, 1], index_col=0, delimiter='\t')
employment_data
```

```
[18]:
      Altersgruppe Bevoelkerung nach Erwerbsstatus \
      Altersgruppe Bevoelkerung nach Erwerbsstatus
Bundesland
Schleswig-Holstein      0      110530
Schleswig-Holstein      5      122650
Schleswig-Holstein     10      148350
Schleswig-Holstein     15      155100
Schleswig-Holstein     20      154120
...
Thueringen              70      156780
Thueringen              75      100740
Thueringen              80       69390
Thueringen              85       36940
Thueringen              90       12620
```

```

      Erwerbspersonen Erwerbstaetige \
      Erwerbspersonen      Insgesamt maennlich weiblich
Bundesland
Schleswig-Holstein      0      0      0      0
Schleswig-Holstein      0      0      0      0
Schleswig-Holstein      0      0      0      0
Schleswig-Holstein     61740     55810     28760     27060
Schleswig-Holstein     121930     114140     59000     55140
...
Thueringen              11320     11130     6630     4490
Thueringen              4260     4230     2310     1930
Thueringen              2350     2350     1130     1220
Thueringen              1040     1040     380     660
Thueringen              0      0      0      0
```

```

      Erwerbslose      Nichterwerbspersonen \
      Insgesamt maennlich weiblich      Insgesamt
Bundesland
Schleswig-Holstein      0      0      0      110530
Schleswig-Holstein      0      0      0      122650
```

Schleswig-Holstein	0	0	0	148350
Schleswig-Holstein	5920	3050	2870	93360
Schleswig-Holstein	7790	4370	3420	32200
...
Thueringen	0	0	0	145460
Thueringen	0	0	0	96490
Thueringen	0	0	0	67030
Thueringen	0	0	0	35900
Thueringen	0	0	0	12280

maennlich weiblich

Bundesland		
Schleswig-Holstein	58600	51940
Schleswig-Holstein	63730	58920
Schleswig-Holstein	75960	72390
Schleswig-Holstein	45210	48150
Schleswig-Holstein	14650	17540
...
Thueringen	64380	81080
Thueringen	39720	56770
Thueringen	22890	44140
Thueringen	9130	26770
Thueringen	2470	9810

[304 rows x 12 columns]

Answer the following questions by querying the employment data set:

1. What is the average age group of employed women in Germany? (2P)
2. What is the average age group of employed women in each of the federal states? (2P)
3. What is the age group with highest unemployment rate of the working population? (2P)