Programming

Winter 2020/2021

Number 06, Submission Deadline: Dec. 22, 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 alltogether? (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])

```python
[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)