kornel_kovacs_hw_3_hotels

Kornel Kovacs 2019 10 01

1. Prerequisites and reads

```
library(tidyverse)
## -- Attaching packages ------ tidyverse 1.2.1 --
## v ggplot2 3.2.1
                     v purrr
                              0.3.2
## v tibble 2.1.3
                     v dplyr
                              0.8.3
           1.0.0
## v tidyr
                     v stringr 1.4.0
## v readr
            1.3.1
                     v forcats 0.4.0
## -- Conflicts -----
                                                  ## x dplyr::filter() masks stats::filter()
## x dplyr::lag()
                   masks stats::lag()
hotels <- read.csv(file = "..//da_data_repo/hotels-vienna/clean/hotels-vienna.csv")
head(hotels)
    country city_actual rating_count center1label center2label neighbourhood
                                                  Donauturm 17. Hernals
## 1 Austria
                Vienna
                                36 City centre
## 2 Austria
                Vienna
                               189 City centre
                                                  Donauturm 17. Hernals
## 3 Austria
                Vienna
                                53 City centre
                                                  Donauturm
                                                            Alsergrund
## 4 Austria
                Vienna
                                55 City centre
                                                  Donauturm
                                                              Alsergrund
## 5 Austria
                Vienna
                                33 City centre
                                                  Donauturm
                                                              Alsergrund
                                25 City centre
## 6 Austria
                Vienna
                                                  Donauturm
                                                              Alsergrund
    price city stars ratingta ratingta_count scarce_room hotel_id offer
       81 Vienna
## 1
                    4
                           4.5
                                         216
                                                           21894
                                                      1
## 2
       81 Vienna
                    4
                           3.5
                                         708
                                                      0
                                                           21897
## 3
       85 Vienna
                    4
                           3.5
                                                          21901
                                         629
                                                      0
       83 Vienna
                           4.0
                                                          21902
                    3
                                         52
                                                      0
## 5
       82 Vienna
                    4
                           3.5
                                         219
                                                          21903
                                                      1
                                                                    1
                    5
      229 Vienna
                           4.5
                                          27
                                                           21904
       offer_cat year month weekend holiday distance distance_alter
## 1 15-50% offer 2017
                        11
                                0
                                        0
                                              2.7
                                                            4.4
## 2 1-15% offer 2017
                                              1.7
                                                            3.8
                        11
                                0
                                        0
## 3 15-50% offer 2017
                        11
                                0
                                        0
                                              1.4
                                                            2.5
## 4 15-50% offer 2017
                                                            2.5
                        11
                                0
                                        0
                                              1.7
## 5 15-50% offer 2017
                                0
                                        0
                                              1.2
                                                            2.8
                        11
## 6 1-15% offer 2017
                        11
                                              0.9
                                                            3.0
##
    accommodation_type nnights rating
## 1
             Apartment
## 2
                Hotel
                            1
                                3.9
## 3
                Hotel
                                3.7
## 4
                Hotel
                                4.0
## 5
                Hotel
                                3.9
## 6
             Apartment
                                4.8
```

2. Overview of data

```
colnames (hotels)
                               "city_actual"
    [1] "country"
                                                     "rating_count"
    [4] "center1label"
                                                     "neighbourhood"
##
                               "center2label"
   [7] "price"
                               "city"
                                                     "stars"
## [10] "ratingta"
                              "ratingta_count"
                                                     "scarce_room"
## [13] "hotel_id"
                              "offer"
                                                     "offer_cat"
## [16] "year"
                               "month"
                                                     "weekend"
## [19] "holiday"
                               "distance"
                                                     "distance alter"
## [22] "accommodation_type" "nnights"
                                                     "rating"
```

3. Filtering (choosing) rows with filter() and saving

```
head((filter(hotels, stars == 4.0)))
     country city_actual rating_count center1label center2label neighbourhood
##
## 1 Austria
                  Vienna
                                    36 City centre
                                                        Donauturm
                                                                     17. Hernals
## 2 Austria
                  Vienna
                                                                     17. Hernals
                                   189
                                         City centre
                                                        Donauturm
                                                        Donauturm
## 3 Austria
                  Vienna
                                    53
                                         City centre
                                                                      Alsergrund
## 4 Austria
                  Vienna
                                    33
                                         City centre
                                                        Donauturm
                                                                      Alsergrund
## 5 Austria
                  Vienna
                                    57
                                         City centre
                                                        Donauturm
                                                                      Alsergrund
## 6 Austria
                  Vienna
                                   161 City centre
                                                        Donauturm
                                                                      Alsergrund
     price
             city stars ratingta ratingta_count scarce_room hotel_id offer
        81 Vienna
                              4.5
                                              216
                                                                  21894
                                                             1
## 2
        81 Vienna
                              3.5
                                              708
                                                                  21897
                       4
                                                             0
                                                                             1
## 3
        85 Vienna
                       4
                              3.5
                                              629
                                                             0
                                                                  21901
                                                                             1
## 4
        82 Vienna
                       4
                              3.5
                                              219
                                                             1
                                                                  21903
                                                                             1
## 5
       103 Vienna
                              3.5
                                              251
                                                                  21906
                                                                             0
## 6
                       4
       150 Vienna
                              4.5
                                              617
                                                             0
                                                                  21907
        offer_cat year month weekend holiday distance distance_alter
## 1 15-50% offer 2017
                           11
                                    0
                                             0
                                                    2.7
## 2 1-15% offer 2017
                                             0
                                                    1.7
                                                                    3.8
                                    0
## 3 15-50% offer 2017
                                                                    2.5
                           11
                                    0
                                             0
                                                    1.4
## 4 15-50% offer 2017
                           11
                                    0
                                             0
                                                    1.2
                                                                    2.8
## 5 0% no offer 2017
                                             0
                                                    0.9
                           11
                                     0
                                                                    2.4
## 6 0% no offer 2017
                           11
                                                    1.0
                                                                    2.7
     accommodation_type nnights rating
## 1
              Apartment
                               1
                                    4.4
## 2
                  Hotel
                                    3.9
## 3
                                    3.7
                  Hotel
                               1
## 4
                  Hotel
                                    3.9
## 5
                  Hotel
                                    3.9
                               1
## 6
                  Hotel
                                    4.6
Alsergrund_4star <- (filter(hotels, stars == 4.0))
```

3.1 Logical operators

3.1.1 AND - &

```
Alsergrund_4star <- filter(hotels, stars == 4.0 & neighbourhood == 'Alsergrund')
Alsergrund_4star <- filter(hotels, stars == 4.0, neighbourhood == 'Alsergrund')
```

3.1.2 OR - |

```
Alsergrund_or_4star <- filter(hotels, stars == 4.0 | neighbourhood == 'Alsergrund')
```

3.1.3 NOT -!

```
not_4star_in_Alsergrund_4star <- filter(hotels, stars != 4.0)</pre>
```

3.1.4 Let's combine them!

```
not_4star_in_Alsergrund <- filter(hotels, stars != 4.0 & neighbourhood == 'Alsergrund')</pre>
```

3.1.5 Trick

```
four_five_stars <- filter(hotels, stars %in% c(4.0,5.0))</pre>
```

3.1.6 Do not overcomplicate, do not use negation unless necessary!

```
head(filter(hotels, !(rating > 4.0 | stars > 4.0)))
```

```
country city_actual rating_count center1label center2label neighbourhood
##
## 1 Austria
                Vienna
                                189 City centre Donauturm 17. Hernals
## 2 Austria
                Vienna
                                 53 City centre
                                                  Donauturm Alsergrund
## 3 Austria
                Vienna
                                 55 City centre
                                                  Donauturm
                                                               Alsergrund
                                                  Donauturm
## 4 Austria
                Vienna
                                 33 City centre
                                                               Alsergrund
                Vienna
## 5 Austria
                                 57 City centre
                                                  Donauturm
                                                               Alsergrund
## 6 Austria
                Vienna
                                 50 City centre
                                                  Donauturm
                                                               Alsergrund
    price
          city stars ratingta ratingta_count scarce_room hotel_id offer
## 1
                           3.5
                                                           21897
       81 Vienna
                    4
                                         708
                                                      0
## 2
       85 Vienna
                           3.5
                                         629
                                                      0
                                                           21901
                                                                     1
## 3
       83 Vienna
                    3
                           4.0
                                                           21902
                                         52
                                                      Ω
                                                                     1
## 4
       82 Vienna
                   4
                           3.5
                                         219
                                                           21903
## 5
     103 Vienna
                   4
                           3.5
                                         251
                                                           21906
                                                                     0
                                                      1
## 6
     80 Vienna
                           3.5
                                         146
                                                           21908
##
       offer_cat year month weekend holiday distance distance_alter
```

```
## 1 1-15% offer 2017
                                               0
                                                       1.7
                                                                        3.8
                            11
## 2 15-50% offer 2017
                                                                        2.5
                            11
                                      0
                                               0
                                                       1.4
## 3 15-50% offer 2017
                            11
                                      0
                                               0
                                                       1.7
                                                                        2.5
## 4 15-50% offer 2017
                                               0
                                      0
                                                       1.2
                                                                        2.8
                            11
      0% no offer 2017
                            11
                                      0
                                               0
                                                       0.9
                                                                        2.4
  6
     1-15% offer 2017
                                      0
                                               0
##
                            11
                                                       0.7
                                                                        2.7
##
     accommodation_type nnights rating
## 1
                   Hotel
## 2
                   Hotel
                                 1
                                      3.7
## 3
                   Hotel
                                 1
                                      4.0
## 4
                   Hotel
                                 1
                                      3.9
## 5
                                      3.9
                   Hotel
                                 1
## 6
                   Hotel
                                      3.5
                                 1
```

head(filter(hotels, rating <= 4.0, stars <= 4.0))

```
country city_actual rating_count center1label center2label neighbourhood
##
## 1 Austria
                   Vienna
                                    189
                                          City centre
                                                          Donauturm
                                                                       17. Hernals
## 2 Austria
                   Vienna
                                     53
                                          City centre
                                                          Donauturm
                                                                        Alsergrund
## 3 Austria
                   Vienna
                                     55
                                          City centre
                                                          Donauturm
                                                                        Alsergrund
## 4 Austria
                                     33
                   Vienna
                                          City centre
                                                          Donauturm
                                                                        Alsergrund
## 5 Austria
                   Vienna
                                     57
                                          City centre
                                                          Donauturm
                                                                        Alsergrund
## 6 Austria
                   Vienna
                                      50
                                          City centre
                                                          Donauturm
                                                                        Alsergrund
##
     price
              city stars ratingta ratingta_count scarce_room hotel_id offer
## 1
        81 Vienna
                       4
                               3.5
                                               708
                                                               0
                                                                    21897
                                                                               1
## 2
                       4
                                                               0
        85 Vienna
                               3.5
                                               629
                                                                    21901
                                                                               1
## 3
        83 Vienna
                       3
                               4.0
                                                52
                                                               0
                                                                    21902
                                                                               1
                               3.5
## 4
        82 Vienna
                       4
                                               219
                                                               1
                                                                    21903
                                                                               1
## 5
       103 Vienna
                       4
                               3.5
                                               251
                                                               1
                                                                    21906
                                                                               0
                       2
                               3.5
## 6
        80 Vienna
                                               146
                                                                    21908
                                                                               1
##
        offer_cat year month weekend holiday distance distance_alter
## 1 1-15% offer 2017
                                              0
                                                      1.7
                            11
                                      0
## 2 15-50% offer 2017
                                              0
                                                                      2.5
                            11
                                     0
                                                      1.4
## 3 15-50% offer 2017
                                     0
                                              0
                                                      1.7
                                                                      2.5
                            11
## 4 15-50% offer 2017
                                              0
                                                                      2.8
                            11
                                     0
                                                      1.2
      0% no offer 2017
                            11
                                              0
                                                      0.9
                                                                      2.4
## 6
     1-15% offer 2017
                            11
                                      0
                                              0
                                                      0.7
                                                                      2.7
     accommodation_type nnights rating
## 1
                   Hotel
                                     3.9
                                1
## 2
                                     3.7
                   Hotel
                                1
## 3
                   Hotel
                                1
                                     4.0
## 4
                   Hotel
                                1
                                     3.9
## 5
                   Hotel
                                1
                                     3.9
## 6
                   Hotel
                                     3.5
```

4. I skipped the NA part, because it would have been copy-pasting, which I try to avoid.

5. arrange()

5.1 Worst hotels according to ratings

Note that in a real analysis we should take into account the number of ratings as well.

head(arrange(hotels, rating))

```
##
     country city_actual rating_count center1label center2label neighbourhood
## 1 Austria
                   Vienna
                                       1
                                          City centre
                                                          Donauturm
                                                                         Favoriten
## 2 Austria
                   Vienna
                                          City centre
                                                                      Innere Stadt
                                                          Donauturm
## 3 Austria
                   Vienna
                                          City centre
                                                          Donauturm
                                                                     Leopoldstadt
                                       1
## 4 Austria
                   Vienna
                                    113
                                          City centre
                                                          Donauturm
                                                                         Favoriten
## 5 Austria
                   Vienna
                                          City centre
                                                                     Innere Stadt
                                      1
                                                          Donauturm
## 6 Austria
                   Vienna
                                     25 City centre
                                                          {\tt Donauturm}
                                                                       Landstrasse
             city stars ratingta ratingta_count scarce_room hotel_id offer
     price
## 1
       127 Vienna
                     3.0
                                NA
                                                NA
                                                                    21938
## 2
       135 Vienna
                     3.5
                                NA
                                                NΑ
                                                                    22034
                                                                              0
                                                              1
       587 Vienna
                                                                    22164
## 3
                     5.0
                                 5
                                                 7
                                                                              1
## 4
                                                                    21948
                                                                              0
        56 Vienna
                     2.0
                                 3
                                               183
                                                              1
## 5
       253 Vienna
                     3.5
                                NA
                                                NA
                                                                    22055
                                                                              0
## 6
        79 Vienna
                     3.0
                                NA
                                                                    22116
                                                                              0
                                                NA
                                                              1
        offer cat year month weekend holiday distance distance alter
## 1 15-50% offer 2017
                            11
                                     0
                                              0
                                                     2.9
                                                                      5.2
     0% no offer 2017
                            11
                                     0
                                              0
                                                      0.3
                                                                      2.6
## 3 15-50% offer 2017
                                     0
                                              0
                                                     0.7
                                                                      2.2
                            11
      0% no offer 2017
                                      0
                                              0
                                                     2.0
                                                                      4.5
                            11
## 5
      0% no offer 2017
                                                     0.1
                                                                      2.8
                                              0
                            11
                                      0
      0% no offer 2017
                            11
                                      0
                                              0
                                                     1.6
                                                                      3.7
     accommodation_type nnights rating
## 1
               Apartment
                                1
                                        1
## 2
               Apartment
                                1
                                        1
## 3
                   Hotel
                                1
                                        1
## 4
                                        2
                   Hotel
                                1
## 5
               Apartment
                                        2
                                1
## 6
               Apartment
```

5.2 Best hotels according to ratings

head(arrange(hotels, desc(rating)))

```
country city_actual rating_count center1label center2label neighbourhood
## 1 Austria
                   Vienna
                                      1
                                         City centre
                                                         Donauturm
                                                                       Josefstadt
## 2 Austria
                   Vienna
                                         City centre
                                                         Donauturm
                                                                       Margareten
## 3 Austria
                   Vienna
                                      1
                                         City centre
                                                         Donauturm
                                                                           Neubau
## 4 Austria
                                         City centre
                   Vienna
                                      3
                                                         Donauturm
                                                                           Neubau
## 5 Austria
                   Vienna
                                      1
                                         City centre
                                                         Donauturm
                                                                           Wieden
## 6 Austria
                   Vienna
                                      2 City centre
                                                         Donauturm
                                                                           Wieden
##
     price
             city stars ratingta ratingta_count scarce_room hotel_id offer
## 1
       363 Vienna
                     3.5
                                                NA
                                                                   22079
                                NA
                                                              1
## 2
                                                                   22210
       150 Vienna
                     3.5
                                NA
                                               NA
                                                              1
                                                                              1
## 3
       160 Vienna
                     3.5
                                                                   22245
                                NA
                                               NA
                                                              1
                                                                              1
        98 Vienna
## 4
                                                                   22257
                     4.0
                                NA
                                               NA
                                                              1
                                                                              1
## 5
        84 Vienna
                     3.5
                                NA
                                               NA
                                                                   22400
                                                                              0
## 6
       109 Vienna
                     3.0
                                 3
                                                14
                                                              1
                                                                   22404
                                                                              1
         offer_cat year month weekend holiday distance distance_alter
       1-15% offer 2017
## 1
                                      0
                                               0
                                                      1.5
                                                                      3.5
                            11
```

```
1-15% offer 2017
                                                                 4.3
                          11
                                                  1.6
                                                                 4.3
     1-15% offer 2017
                          11
                                   0
                                           0
                                                  1.6
## 4 15-50% offer 2017
                          11
                                                  1.7
                                                                 4.2
                                   0
## 5
     0% no offer 2017
                                   0
                                          0
                                                  0.9
                                                                3.6
                          11
## 6 50%-75% offer 2017
                          11
                                   0
                                           0
                                                  1.5
                                                                3.8
## accommodation_type nnights rating
## 1
             Apartment
## 2
             Apartment
                             1
## 3
             Apartment
                             1
## 4
                                    5
             Apartment
                             1
## 5
             Apartment
                             1
## 6
                                    5
             Apartment
                             1
5. select()
head(select(hotels, accommodation_type , nnights , rating))
     accommodation_type nnights rating
##
## 1
             Apartment
                             1
## 2
                 Hotel
                                  3.9
                             1
## 3
                 Hotel
                             1
                                  3.7
## 4
                 Hotel
                             1
                                4.0
## 5
                 Hotel
                                3.9
                             1
## 6
                                  4.8
             Apartment
head(select(hotels, accommodation_type:rating))
##
    accommodation_type nnights rating
## 1
             Apartment
                            1
## 2
                 Hotel
                                  3.9
                             1
## 3
                 Hotel
                                  3.7
                             1
                                  4.0
## 4
                 Hotel
                             1
                 Hotel
## 5
                                  3.9
## 6
             Apartment
                             1
                                  4.8
head(select(hotels, -(center1label:rating)))
     country city_actual rating_count
## 1 Austria
                 Vienna
                 Vienna
## 2 Austria
                                 189
## 3 Austria
                 Vienna
                                 53
## 4 Austria
                 Vienna
                                  55
## 5 Austria
                 Vienna
                                  33
## 6 Austria
                 Vienna
                                  25
head(select(hotels, accommodation_type , rating, everything()))
     accommodation_type rating country city_actual rating_count center1label
```

Vienna

36 City centre

4.4 Austria

1

Apartment

```
## 2
                   Hotel
                             3.9 Austria
                                               Vienna
                                                                189 City centre
## 3
                             3.7 Austria
                                               Vienna
                   Hotel
                                                                 53
                                                                     City centre
                                               Vienna
                                                                     City centre
## 4
                   Hotel
                             4.0 Austria
## 5
                   Hotel
                             3.9 Austria
                                               Vienna
                                                                 33
                                                                     City centre
## 6
               Apartment
                             4.8 Austria
                                               Vienna
                                                                 25
                                                                     City centre
##
     center2label neighbourhood price
                                           city stars ratingta ratingta count
                     17. Hernals
## 1
        Donauturm
                                     81 Vienna
                                                    4
                                                                            216
                     17. Hernals
                                                                            708
## 2
        Donauturm
                                     81 Vienna
                                                    4
                                                            3.5
## 3
        Donauturm
                      Alsergrund
                                     85 Vienna
                                                    4
                                                            3.5
                                                                            629
## 4
        Donauturm
                      Alsergrund
                                     83 Vienna
                                                    3
                                                            4.0
                                                                             52
## 5
        Donauturm
                      Alsergrund
                                     82 Vienna
                                                            3.5
                                                                            219
## 6
                                                    5
                                                            4.5
                                                                             27
        Donauturm
                      Alsergrund
                                    229 Vienna
##
     scarce_room hotel_id offer
                                     offer_cat year month weekend holiday
## 1
                                1 15-50% offer 2017
                1
                     21894
                                                         11
                                                                   0
                                                                           0
## 2
                0
                     21897
                                1 1-15% offer 2017
                                                                   0
                                                                           0
                                                         11
## 3
                0
                     21901
                                1 15-50% offer 2017
                                                         11
                                                                   0
                                                                           0
## 4
                0
                                1 15-50% offer 2017
                                                                   0
                                                                           0
                     21902
                                                         11
## 5
                1
                     21903
                                1 15-50% offer 2017
                                                         11
                                                                   0
                                                                           0
                     21904
## 6
                                1 1-15% offer 2017
                                                                   0
                                                                           0
                                                         11
                1
##
     distance distance alter nnights
## 1
          2.7
                          4.4
## 2
          1.7
                          3.8
## 3
          1.4
                          2.5
                                     1
## 4
          1.7
                          2.5
## 5
          1.2
                          2.8
## 6
          0.9
                          3.0
                                     1
```

head(rename(hotels, customer_rating = rating))

```
##
     country city_actual rating_count center1label center2label neighbourhood
## 1 Austria
                   Vienna
                                        City centre
                                                                      17. Hernals
                                     36
                                                         Donauturm
## 2 Austria
                   Vienna
                                    189
                                         City centre
                                                                      17. Hernals
                                                         Donauturm
## 3 Austria
                   Vienna
                                     53
                                         City centre
                                                         Donauturm
                                                                       Alsergrund
## 4 Austria
                   Vienna
                                     55
                                         City centre
                                                         Donauturm
                                                                       Alsergrund
## 5 Austria
                   Vienna
                                         City centre
                                     33
                                                         Donauturm
                                                                       Alsergrund
## 6 Austria
                   Vienna
                                     25 City centre
                                                         Donauturm
                                                                       Alsergrund
             city stars ratingta ratingta_count scarce_room hotel_id offer
     price
                              4.5
## 1
        81 Vienna
                       4
                                              216
                                                             1
                                                                   21894
## 2
        81 Vienna
                       4
                              3.5
                                              708
                                                                   21897
                                                             0
                                                                             1
## 3
        85 Vienna
                       4
                              3.5
                                              629
                                                             0
                                                                   21901
                                                                             1
## 4
        83 Vienna
                       3
                              4.0
                                               52
                                                             0
                                                                   21902
                                                                             1
## 5
        82 Vienna
                               3.5
                                              219
                                                             1
                                                                   21903
                                                                             1
## 6
       229 Vienna
                       5
                               4.5
                                                27
                                                                   21904
                                                             1
        offer_cat year month weekend holiday distance distance_alter
## 1 15-50% offer 2017
                                     0
                                             0
                                                     2.7
                                                                     4.4
## 2 1-15% offer 2017
                                             0
                                                     1.7
                                                                     3.8
                           11
                                     0
## 3 15-50% offer 2017
                                     0
                                             0
                                                     1.4
                                                                     2.5
                           11
## 4 15-50% offer 2017
                                             0
                                                                     2.5
                                     0
                                                     1.7
                           11
## 5 15-50% offer 2017
                                             0
                                                     1.2
                                                                     2.8
                           11
## 6 1-15% offer 2017
                                                     0.9
                           11
                                     0
                                             0
                                                                     3.0
     accommodation_type nnights customer_rating
## 1
              Apartment
                               1
                                              4.4
## 2
                               1
                                              3.9
                   Hotel
## 3
                                              3.7
                   Hotel
                               1
```

##	4	Hotel	1	4.0
##	5	Hotel	1	3.9
##	6	Apartment	1	4.8