Data_exploration

Group_4

2024-03-19

Data exploration

This is an R Markdown document where the exploration of the raw data can be found.

Summary statistics

We start with some summary statistics based on the raw data to see for example which variables are characters and to see some basic statistical insights, such as means and medians.

```
summary(all_data)
```

```
##       ...1           host_id            host_url          host_name        
##  Min.   :     1   Min.   :      275   Length:184734      Length:184734     
##  1st Qu.: 46184   1st Qu.: 28033691   Class :character   Class :character  
##  Median : 92368   Median :105263166   Mode  :character   Mode  :character  
##  Mean   : 92368   Mean   :176862777                                        
##  3rd Qu.:138551   3rd Qu.:310121433                                        
##  Max.   :184734   Max.   :552019444                                        
##                                                                            
##    host_since         host_location       host_about        host_response_time
##  Min.   :2008-04-17   Length:184734      Length:184734      Length:184734     
##  1st Qu.:2015-03-01   Class :character   Class :character   Class :character  
##  Median :2016-12-02   Mode  :character   Mode  :character   Mode  :character  
##  Mean   :2017-07-18                                                           
##  3rd Qu.:2019-11-17                                                           
##  Max.   :2023-12-21                                                           
##  NA’s   :17                                                                   
##  host_response_rate host_acceptance_rate host_is_superhost host_thumbnail_url
##  Length:184734      Length:184734        Mode :logical     Length:184734     
##  Class :character   Class :character     FALSE:137282      Class :character  
##  Mode  :character   Mode  :character     TRUE :47241       Mode  :character  
##                                          NA’s :211                           
##                                                                              
##                                                                              
##                                                                              
##  host_picture_url   host_neighbourhood host_listings_count
##  Length:184734      Length:184734      Min.   :   1.00    
##  Class :character   Class :character   1st Qu.:   1.00    
##  Mode  :character   Mode  :character   Median :   2.00    
##                                        Mean   :  36.21    
##                                         3rd Qu.:   7.00
##                                         Max.   :3981.00
##                                         NA's   :17
##  host_total_listings_count host_verifications host_has_profile_pic
##  Min.   :   1.00           Length:184734      Mode :logical
##  1st Qu.:   1.00           Class :character   FALSE:5540
##  Median :   2.00           Mode  :character   TRUE :179177
##  Mean   :  58.29                              NA's :17
##  3rd Qu.:   8.00
##  Max.   :9722.00
##  NA's   :17
##  host_identity_verified review_scores_rating review_scores_accuracy
##  Mode :logical          Min.   :0.00         Min.   :0.00
##  FALSE:16347            1st Qu.:4.67         1st Qu.:4.73
##  TRUE :168370           Median :4.86         Median :4.89
##  NA's :17               Mean   :4.74         Mean   :4.78
##                         3rd Qu.:5.00         3rd Qu.:5.00
##                         Max.   :5.00         Max.   :5.00
##                         NA's   :38943        NA's   :38981
##  review_scores_cleanliness review_scores_checkin review_scores_communication
##  Min.   :0.00              Min.   :0.00          Min.   :0.00
##  1st Qu.:4.60              1st Qu.:4.80          1st Qu.:4.83
##  Median :4.86              Median :4.94          Median :4.96
##  Mean   :4.71              Mean   :4.83          Mean   :4.84
##  3rd Qu.:5.00              3rd Qu.:5.00          3rd Qu.:5.00
##  Max.   :5.00              Max.   :5.00          Max.   :5.00
##  NA's   :38973             NA's   :39000         NA's   :38980
##  review_scores_location review_scores_value reviews_per_month
##  Min.   :0.00           Min.   :0.00        Min.   : 0.01
##  1st Qu.:4.68           1st Qu.:4.53        1st Qu.: 0.20
##  Median :4.88           Median :4.75        Median : 0.54
##  Mean   :4.77           Mean   :4.65        Mean   : 1.01
##  3rd Qu.:5.00           3rd Qu.:4.92        3rd Qu.: 1.28
##  Max.   :5.00           Max.   :5.00        Max.   :61.92
##  NA's   :38998          NA's   :39003       NA's   :39096
##  Region_Dataset     Country_Dataset
##  Length:184734      Length:184734
##  Class :character   Class :character
##  Mode  :character   Mode  :character
##
##
##
##
```

Observations per region

Several datasets of Greece and France have been merged. Therefore, we look at how many observations each country and each region has in the dataset.

```
# Observations per country
country_counts <- table(all_data$Country_Dataset)
print(country_counts)
```

```
##
## France Greece
## 109363  75371
```

```
# Observations per region
region_counts <- table(all_data$Region_Dataset)
print(region_counts)
```

```
##
##       Athens     Bordeaux        Crete         Lyon        Paris  Pays Basque
##        13182        11854        25416        10331        74329        12849
## South Aegean Thessaloniki
##        32698         4075
```

Observations for hosts

As this research is about the impact of hosts on guest reviews, we will provide the observation count for some of the host variables.

```
# Observations for presence of profile pictures
profilepic_counts <- table(all_data$host_has_profile_pic)
print(profilepic_counts)
```

```
##
##  FALSE   TRUE
##   5540 179177
```

```
# Observations for presence of verified identity
identity_verified_counts <- table(all_data$host_identity_verified)
print(identity_verified_counts)
```

```
##
##  FALSE   TRUE
##  16347 168370
```

```
# Observations for host response time
responsetime_counts <- table(all_data$host_response_time)
print(responsetime_counts)
```

```
##
## a few days or more                N/A       within a day within a few hours
##               4037              68377              14055              17659
##     within an hour
##              80589
```

```
# Observations for presence of superhost status
superhost_counts <- table(all_data$host_is_superhost)
print(superhost_counts)
```

```
##
##  FALSE   TRUE
## 137282  47241
```

Review scores per region

We will provide the average review rating per country and region

```
# Average review score per country
review_score_country <- all_data %>%
  group_by(Country_Dataset) %>%
  summarise(mean_review_score = mean(review_scores_rating, na.rm = TRUE))

review_score_country
```

```
## # A tibble: 2 x 2
##   Country_Dataset mean_review_score
##   <chr>                       <dbl>
## 1 France                       4.71
## 2 Greece                       4.79
```

```
# Average review score per region
review_score_region <- all_data %>%
  group_by(Country_Dataset, Region_Dataset) %>%
  summarise(mean_review_score = mean(review_scores_rating, na.rm = TRUE))
```

```
## ‘summarise()‘ has grouped output by ’Country_Dataset’. You can override using
## the ‘.groups‘ argument.
```

```
review_score_region
```

```
## # A tibble: 8 x 3
## # Groups:   Country_Dataset [2]
##   Country_Dataset Region_Dataset mean_review_score
##   <chr>           <chr>                      <dbl>
## 1 France          Bordeaux                    4.75
## 2 France          Lyon                        4.72
## 3 France          Paris                       4.69
## 4 France          Pays Basque                 4.75
## 5 Greece          Athens                      4.74
## 6 Greece          Crete                       4.82
## 7 Greece          South Aegean                4.81
## 8 Greece          Thessaloniki                4.71
```

Host variables + review scores

We will explore some key statistics related to some host variables and their review scores.

```
# Average review scores for the presence of a profile pic
review_score_profilepic <- all_data %>%
  group_by(host_has_profile_pic) %>%
  summarise(mean_review_score = mean(review_scores_rating, na.rm = TRUE))

review_score_profilepic
```

```
## # A tibble: 3 x 2
##   host_has_profile_pic mean_review_score
##   <lgl>                            <dbl>
## 1 FALSE                             4.75
## 2 TRUE                              4.74
## 3 NA                                4.72
```

```
# Average review scores for the presence of a verified identity
review_score_verification <- all_data %>%
  group_by(host_identity_verified) %>%
  summarise(mean_review_score = mean(review_scores_rating, na.rm = TRUE))

review_score_verification
```

```
## # A tibble: 3 x 2
##   host_identity_verified mean_review_score
##   <lgl>                              <dbl>
## 1 FALSE                               4.66
## 2 TRUE                                4.75
## 3 NA                                  4.72
```

```
# Average review scores for the presence of a superhost status
review_score_superhost <- all_data %>%
  group_by(host_is_superhost) %>%
  summarise(mean_review_score = mean(review_scores_rating, na.rm = TRUE))

review_score_superhost
```

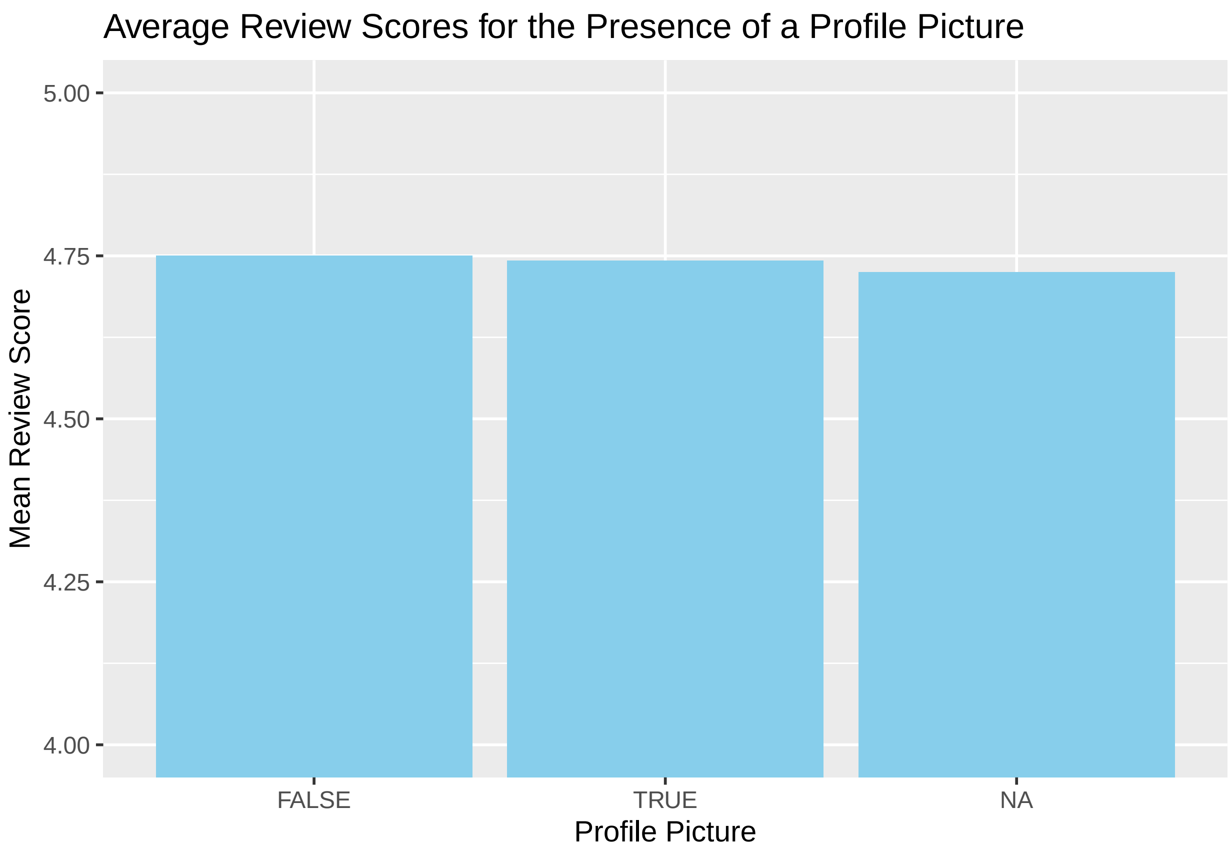
```
## # A tibble: 3 x 2
##   host_is_superhost mean_review_score
##   <lgl>                         <dbl>
## 1 FALSE                          4.69
## 2 TRUE                           4.87
## 3 NA                             4.75
```

Visualizations for the host variables + review scores

To create a visual oversight of the host variables and their respective review scores, the following visualization have been created:

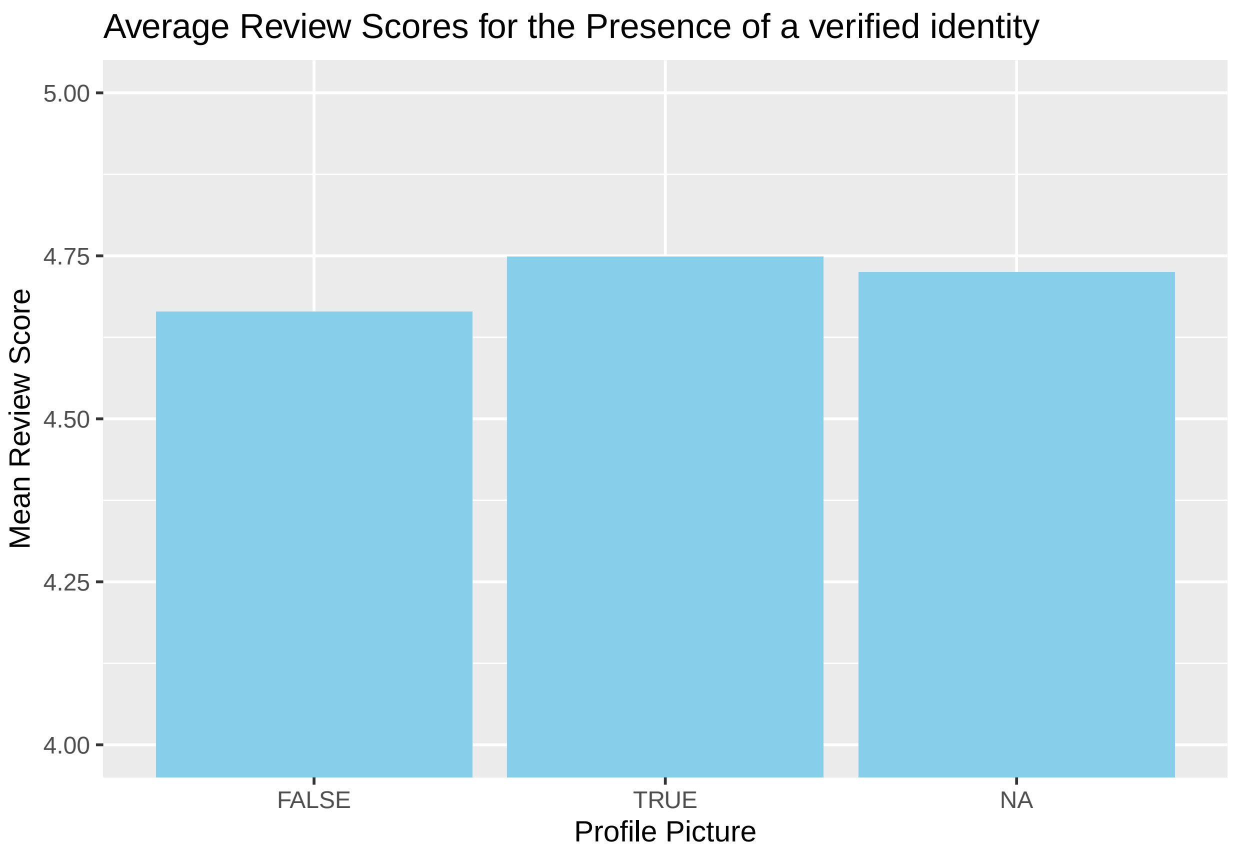
```
# Average review scores for the presence of a profile pic
bar_plot_profilepic <- ggplot(review_score_profilepic, aes(x = host_has_profile_pic, y = mean_review_sc
  geom_bar(stat = "identity", fill = "skyblue") +
  coord_cartesian(ylim = c(4, 5)) +
  labs(x = "Profile Picture", y = "Mean Review Score") +
  ggtitle("Average Review Scores for the Presence of a Profile Picture")

bar_plot_profilepic
```



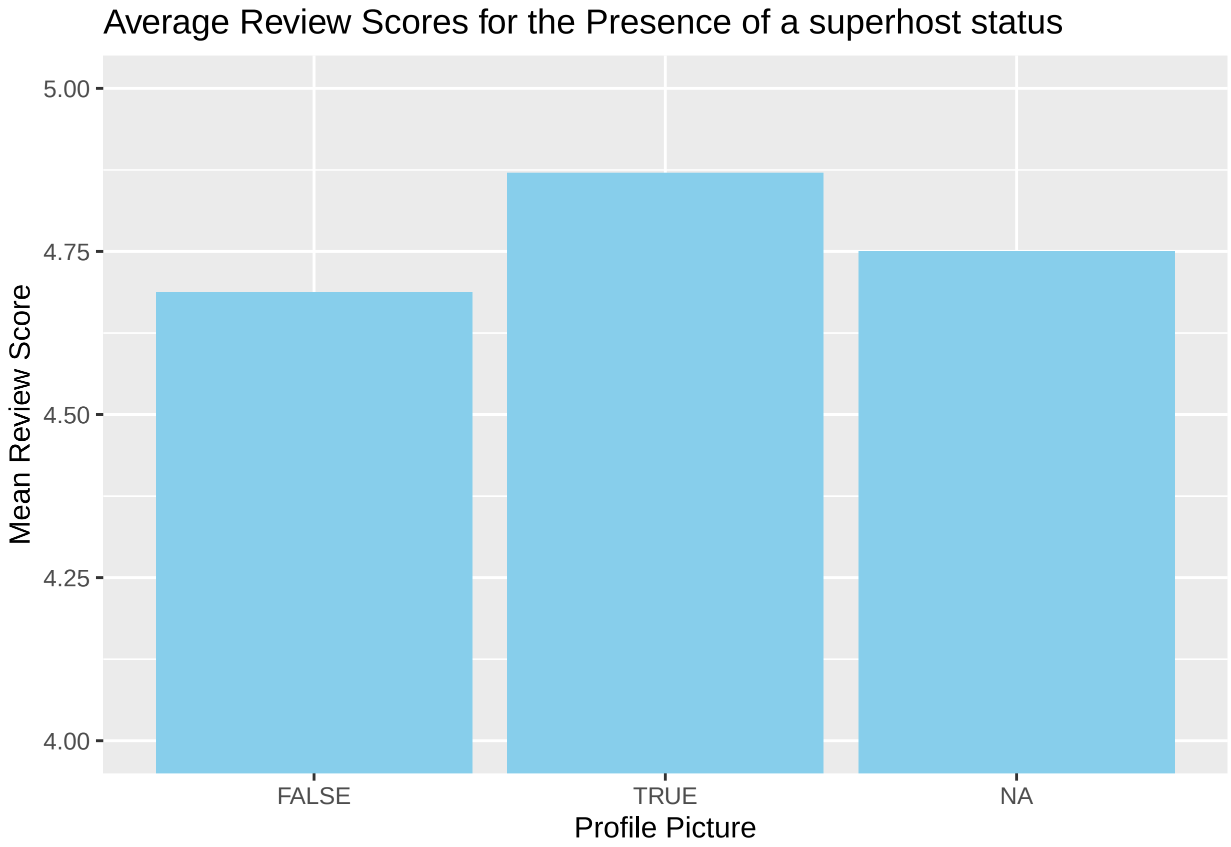
```
# Average review scores for the presence of a verified identity
bar_plot_identity <- ggplot(review_score_verification, aes(x = host_identity_verified, y = mean_review_s
  geom_bar(stat = "identity", fill = "skyblue") +
  coord_cartesian(ylim = c(4, 5)) +
  labs(x = "Profile Picture", y = "Mean Review Score") +
  ggtitle("Average Review Scores for the Presence of a verified identity")

bar_plot_identity
```



```
# Average review scores for the presence of a verified identity
bar_plot_superhost <- ggplot(review_score_superhost, aes(x = host_is_superhost, y = mean_review_score))
  geom_bar(stat = "identity", fill = "skyblue") +
  coord_cartesian(ylim = c(4, 5)) +
  labs(x = "Profile Picture", y = "Mean Review Score") +
  ggtitle("Average Review Scores for the Presence of a superhost status")

bar_plot_superhost
```


Average Review Scores for the Presence of a superhost status
Mean Review Score
5.00
4.75
4.50
4.25
4.00
FALSE
TRUE
NA
Profile Picture