Week-4: Code-along

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II. Code to edit and execute using the Code-along.Rmd file

A. Data Wrangling

1. Loading packages (Slide #16)

```r
# Load package tidyverse
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----------------------- tidyverse 2.0.0 --
## v dplyr     1.1.2      v readr     2.1.4
## v forcats   1.0.0      v stringr   1.5.0
## v ggplot2   3.4.3      v tibble    3.2.1
## v lubridate 1.9.2      v tidyr     1.3.0
## v purrr     1.0.2
## -- Conflicts ------------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

2. Loading data-set (Slide #16)

```r
# Read data from the hotels.csv file and assign it to a variable named, "hotels"
hotels <- read_csv("hotels.csv")
```

```
## Rows: 119390 Columns: 32
## -- Column specification -------------------------------------------------
## Delimiter: ","
## chr  (13): hotel, arrival_date_month, meal, country, market_segment, distrib...
## dbl  (18): is_canceled, lead_time, arrival_date_year, arrival_date_week_numb...
## date  (1): reservation_status_date
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

3. List names of the variables in the data-set (Slide #19)

```
# Enter code here
names(hotels)
```

```
##  [1] "hotel"                         "is_canceled"
##  [3] "lead_time"                     "arrival_date_year"
##  [5] "arrival_date_month"            "arrival_date_week_number"
##  [7] "arrival_date_day_of_month"     "stays_in_weekend_nights"
##  [9] "stays_in_week_nights"          "adults"
## [11] "children"                      "babies"
## [13] "meal"                          "country"
## [15] "market_segment"                "distribution_channel"
## [17] "is_repeated_guest"             "previous_cancellations"
## [19] "previous_bookings_not_canceled" "reserved_room_type"
## [21] "assigned_room_type"            "booking_changes"
## [23] "deposit_type"                  "agent"
## [25] "company"                       "days_in_waiting_list"
## [27] "customer_type"                 "adr"
## [29] "required_car_parking_spaces"   "total_of_special_requests"
## [31] "reservation_status"            "reservation_status_date"
```

4. Glimpse of contents of the data-set (Slide #20)

```
# Enter code here
glimpse(hotels)
```

```
## Rows: 119,390
## Columns: 32
## $ hotel                          <chr> "Resort Hotel", "Resort Hotel", "Resort~
## $ is_canceled                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, ~
## $ lead_time                      <dbl> 342, 737, 7, 13, 14, 14, 0, 9, 85, 75, ~
## $ arrival_date_year              <dbl> 2015, 2015, 2015, 2015, 2015, 2015, 201~
## $ arrival_date_month             <chr> "July", "July", "July", "July", "July",~
## $ arrival_date_week_number       <dbl> 27, 27, 27, 27, 27, 27, 27, 27, 27, 27,~
## $ arrival_date_day_of_month      <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, ~
## $ stays_in_weekend_nights        <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ stays_in_week_nights           <dbl> 0, 0, 1, 1, 2, 2, 2, 2, 3, 3, 4, 4, 4, ~
## $ adults                         <dbl> 2, 2, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, ~
## $ children                       <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ babies                         <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ meal                           <chr> "BB", "BB", "BB", "BB", "BB", "BB", "BB~
## $ country                        <chr> "PRT", "PRT", "GBR", "GBR", "GBR", "GBR~
## $ market_segment                 <chr> "Direct", "Direct", "Direct", "Corporat~
## $ distribution_channel           <chr> "Direct", "Direct", "Direct", "Corporat~
## $ is_repeated_guest              <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ previous_cancellations         <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ previous_bookings_not_canceled <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ reserved_room_type             <chr> "C", "C", "A", "A", "A", "A", "C", "C",~
## $ assigned_room_type             <chr> "C", "C", "C", "A", "A", "A", "C", "C",~
```

```
## $ booking_changes              <dbl> 3, 4, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ deposit_type                 <chr> "No Deposit", "No Deposit", "No Deposit~
## $ agent                        <chr> "NULL", "NULL", "NULL", "304", "240", "~
## $ company                      <chr> "NULL", "NULL", "NULL", "NULL", "NULL",~
## $ days_in_waiting_list         <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ customer_type                <chr> "Transient", "Transient", "Transient", ~
## $ adr                          <dbl> 0.00, 0.00, 75.00, 75.00, 98.00, 98.00,~
## $ required_car_parking_spaces  <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ~
## $ total_of_special_requests    <dbl> 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 3, ~
## $ reservation_status           <chr> "Check-Out", "Check-Out", "Check-Out", ~
## $ reservation_status_date      <date> 2015-07-01, 2015-07-01, 2015-07-02, 20~
```

B. Choosing rows or columns

5. Select a single column (Slide #24)

```
# Enter code here
select(hotels,lead_time)
```

```
## # A tibble: 119,390 x 1
##    lead_time
##        <dbl>
## 1        342
## 2        737
## 3          7
## 4         13
## 5         14
## 6         14
## 7          0
## 8          9
## 9         85
## 10        75
## # i 119,380 more rows
```

6. Select multiple columns (Slide #25)

```
# Enter code here
select(hotels,lead_time,agent,market_segment)
```

```
## # A tibble: 119,390 x 3
##    lead_time agent market_segment
##        <dbl> <chr> <chr>
## 1        342 NULL  Direct
## 2        737 NULL  Direct
## 3          7 NULL  Direct
## 4         13 304   Corporate
## 5         14 240   Online TA
## 6         14 240   Online TA
## 7          0 NULL  Direct
```

```
##  8          9 303   Direct
##  9         85 240   Online TA
## 10         75 15    Offline TA/TO
## # i 119,380 more rows
```

7. Arrange entries of a column (Slide #28)

```
# Enter code here
arrange(hotels,lead_time)
```

```
## # A tibble: 119,390 x 32
##    hotel        is_canceled lead_time arrival_date_year arrival_date_month
##    <chr>              <dbl>     <dbl>             <dbl> <chr>
##  1 Resort Hotel           0         0              2015 July
##  2 Resort Hotel           0         0              2015 July
##  3 Resort Hotel           0         0              2015 July
##  4 Resort Hotel           0         0              2015 July
##  5 Resort Hotel           0         0              2015 July
##  6 Resort Hotel           0         0              2015 July
##  7 Resort Hotel           0         0              2015 July
##  8 Resort Hotel           0         0              2015 July
##  9 Resort Hotel           0         0              2015 July
## 10 Resort Hotel           0         0              2015 July
## # i 119,380 more rows
## # i 27 more variables: arrival_date_week_number <dbl>,
## #   arrival_date_day_of_month <dbl>, stays_in_weekend_nights <dbl>,
## #   stays_in_week_nights <dbl>, adults <dbl>, children <dbl>, babies <dbl>,
## #   meal <chr>, country <chr>, market_segment <chr>,
## #   distribution_channel <chr>, is_repeated_guest <dbl>,
## #   previous_cancellations <dbl>, previous_bookings_not_canceled <dbl>, ...
```

8. Arrange entries of a column in the descending order (Slide #30)

```
# Enter code here
arrange(hotels,desc(lead_time))
```

```
## # A tibble: 119,390 x 32
##    hotel        is_canceled lead_time arrival_date_year arrival_date_month
##    <chr>              <dbl>     <dbl>             <dbl> <chr>
##  1 Resort Hotel           0       737              2015 July
##  2 Resort Hotel           0       709              2016 February
##  3 City Hotel             1       629              2017 March
##  4 City Hotel             1       629              2017 March
##  5 City Hotel             1       629              2017 March
##  6 City Hotel             1       629              2017 March
##  7 City Hotel             1       629              2017 March
##  8 City Hotel             1       629              2017 March
##  9 City Hotel             1       629              2017 March
## 10 City Hotel             1       629              2017 March
## # i 119,380 more rows
```

```
## # i 27 more variables: arrival_date_week_number <dbl>,
## #   arrival_date_day_of_month <dbl>, stays_in_weekend_nights <dbl>,
## #   stays_in_week_nights <dbl>, adults <dbl>, children <dbl>, babies <dbl>,
## #   meal <chr>, country <chr>, market_segment <chr>,
## #   distribution_channel <chr>, is_repeated_guest <dbl>,
## #   previous_cancellations <dbl>, previous_bookings_not_canceled <dbl>, ...
```

9. Select columns and arrange the entries of a column (Slide #31)

```r
# Enter code here
arrange(select(hotels,lead_time),desc(lead_time))
```

```
## # A tibble: 119,390 x 1
##    lead_time
##        <dbl>
## 1        737
## 2        709
## 3        629
## 4        629
## 5        629
## 6        629
## 7        629
## 8        629
## 9        629
## 10       629
## # i 119,380 more rows
```

10. Select columns and arrange the entries of a column using the pipe operator (Slide #37)

```r
# Enter code here
hotels %>%
  select(lead_time) %>%
  arrange(desc(lead_time))
```

```
## # A tibble: 119,390 x 1
##    lead_time
##        <dbl>
## 1        737
## 2        709
## 3        629
## 4        629
## 5        629
## 6        629
## 7        629
## 8        629
## 9        629
## 10       629
## # i 119,380 more rows
```

11. Pick rows matching a condition (Slide #44)

```
# Enter code here
hotels %>%
  filter(children >= 1) %>%
    select(hotel,children)
```

```
## # A tibble: 8,590 x 2
##    hotel        children
##    <chr>           <dbl>
##  1 Resort Hotel        1
##  2 Resort Hotel        2
##  3 Resort Hotel        2
##  4 Resort Hotel        2
##  5 Resort Hotel        1
##  6 Resort Hotel        1
##  7 Resort Hotel        2
##  8 Resort Hotel        2
##  9 Resort Hotel        1
## 10 Resort Hotel        2
## # i 8,580 more rows
```

12. Pick rows matching multiple conditions (Slide #46)

```
# Enter code here
hotels %>%
  filter(children >= 1, hotel == "City Hotel") %>%
    select(hotel,children)
```

```
## # A tibble: 5,106 x 2
##    hotel      children
##    <chr>         <dbl>
##  1 City Hotel        1
##  2 City Hotel        2
##  3 City Hotel        1
##  4 City Hotel        1
##  5 City Hotel        1
##  6 City Hotel        1
##  7 City Hotel        1
##  8 City Hotel        1
##  9 City Hotel        1
## 10 City Hotel        1
## # i 5,096 more rows
```

13. Non-conditional selection of rows: sequence of indices (Slide #49)

```
# Enter code here
hotels %>%
  slice(1:5)
```

```
## # A tibble: 5 x 32
##   hotel        is_canceled lead_time arrival_date_year arrival_date_month
##   <chr>              <dbl>     <dbl>             <dbl> <chr>
## 1 Resort Hotel           0       342              2015 July
## 2 Resort Hotel           0       737              2015 July
## 3 Resort Hotel           0         7              2015 July
## 4 Resort Hotel           0        13              2015 July
## 5 Resort Hotel           0        14              2015 July
## # i 27 more variables: arrival_date_week_number <dbl>,
## #   arrival_date_day_of_month <dbl>, stays_in_weekend_nights <dbl>,
## #   stays_in_week_nights <dbl>, adults <dbl>, children <dbl>, babies <dbl>,
## #   meal <chr>, country <chr>, market_segment <chr>,
## #   distribution_channel <chr>, is_repeated_guest <dbl>,
## #   previous_cancellations <dbl>, previous_bookings_not_canceled <dbl>,
## #   reserved_room_type <chr>, assigned_room_type <chr>, ...
```

14. Non-conditional selection of rows: non-consecutive/specific indices (Slide #50)

```
# Enter code here
hotels %>%
  slice(1,3,5)
```

```
## # A tibble: 3 x 32
##   hotel        is_canceled lead_time arrival_date_year arrival_date_month
##   <chr>              <dbl>     <dbl>             <dbl> <chr>
## 1 Resort Hotel           0       342              2015 July
## 2 Resort Hotel           0         7              2015 July
## 3 Resort Hotel           0        14              2015 July
## # i 27 more variables: arrival_date_week_number <dbl>,
## #   arrival_date_day_of_month <dbl>, stays_in_weekend_nights <dbl>,
## #   stays_in_week_nights <dbl>, adults <dbl>, children <dbl>, babies <dbl>,
## #   meal <chr>, country <chr>, market_segment <chr>,
## #   distribution_channel <chr>, is_repeated_guest <dbl>,
## #   previous_cancellations <dbl>, previous_bookings_not_canceled <dbl>,
## #   reserved_room_type <chr>, assigned_room_type <chr>, ...
```

15. Pick unique rows using distinct() (Slide #52)

```
# Enter code here
hotels %>%
  distinct(hotel)
```

```
## # A tibble: 2 x 1
##   hotel
##   <chr>
## 1 Resort Hotel
## 2 City Hotel
```

C. Creating new columns

16. Creating a single column with mutate() (Slide #56)

```
# Enter code here
hotels %>%
  mutate(little_ones = children + babies) %>%
    select(hotel, little_ones, children, babies)
```

```
## # A tibble: 119,390 x 4
##    hotel        little_ones children babies
##    <chr>              <dbl>    <dbl>  <dbl>
##  1 Resort Hotel           0        0      0
##  2 Resort Hotel           0        0      0
##  3 Resort Hotel           0        0      0
##  4 Resort Hotel           0        0      0
##  5 Resort Hotel           0        0      0
##  6 Resort Hotel           0        0      0
##  7 Resort Hotel           0        0      0
##  8 Resort Hotel           0        0      0
##  9 Resort Hotel           0        0      0
## 10 Resort Hotel           0        0      0
## # i 119,380 more rows
```

17. Creating multiple columns with mutate() (Slide #58)

```
# Enter code here
hotels %>%
  mutate(little_ones = children + babies,
           average_little_ones = mean(little_ones)) %>%
    select(hotel, little_ones, children, babies, average_little_ones)
```

```
## # A tibble: 119,390 x 5
##    hotel        little_ones children babies average_little_ones
##    <chr>              <dbl>    <dbl>  <dbl>               <dbl>
##  1 Resort Hotel           0        0      0                  NA
##  2 Resort Hotel           0        0      0                  NA
##  3 Resort Hotel           0        0      0                  NA
##  4 Resort Hotel           0        0      0                  NA
##  5 Resort Hotel           0        0      0                  NA
##  6 Resort Hotel           0        0      0                  NA
##  7 Resort Hotel           0        0      0                  NA
##  8 Resort Hotel           0        0      0                  NA
##  9 Resort Hotel           0        0      0                  NA
## 10 Resort Hotel           0        0      0                  NA
## # i 119,380 more rows
```

D. More operations with examples

18. count() to get frequencies (Slide #60)

```
# Enter code here
hotels %>%
  count(market_segment)
```

```
## # A tibble: 8 x 2
##   market_segment      n
##   <chr>           <int>
## 1 Aviation          237
## 2 Complementary     743
## 3 Corporate        5295
## 4 Direct          12606
## 5 Groups          19811
## 6 Offline TA/TO   24219
## 7 Online TA       56477
## 8 Undefined           2
```

19. count() to get frequencies with sorting of count (Slide #61)

```
# Enter code here
hotels %>%
  count(market_segment, sort = TRUE)
```

```
## # A tibble: 8 x 2
##   market_segment      n
##   <chr>           <int>
## 1 Online TA       56477
## 2 Offline TA/TO   24219
## 3 Groups          19811
## 4 Direct          12606
## 5 Corporate        5295
## 6 Complementary     743
## 7 Aviation          237
## 8 Undefined           2
```

20. count() multiple variables (Slide #62)

```
# Enter code here
hotels %>%
  count(hotel, market_segment)
```

```
## # A tibble: 14 x 3
##    hotel        market_segment      n
##    <chr>        <chr>           <int>
##  1 City Hotel   Aviation          237
```

```
##  2 City Hotel   Complementary    542
##  3 City Hotel   Corporate       2986
##  4 City Hotel   Direct          6093
##  5 City Hotel   Groups         13975
##  6 City Hotel   Offline TA/TO  16747
##  7 City Hotel   Online TA      38748
##  8 City Hotel   Undefined          2
##  9 Resort Hotel Complementary    201
## 10 Resort Hotel Corporate       2309
## 11 Resort Hotel Direct          6513
## 12 Resort Hotel Groups          5836
## 13 Resort Hotel Offline TA/TO   7472
## 14 Resort Hotel Online TA      17729
```

21. summarise() for summary statistics (Slide #63)

```
# Enter code here
hotels %>%
  summarise(mean_adr = mean(adr))
```

```
## # A tibble: 1 x 1
##   mean_adr
##      <dbl>
## 1    102.
```

22. summarise() by using group_by to find mean (Slide #64)

```
# Enter code here
hotels %>%
  group_by(hotel) %>%
  summarise(mean_adr = mean(adr))
```

```
## # A tibble: 2 x 2
##   hotel        mean_adr
##   <chr>           <dbl>
## 1 City Hotel      105.
## 2 Resort Hotel    95.0
```

23. summarise() by using group_by to get count (Slide #65)

```
# Enter code here
hotels %>%
  group_by(hotel) %>%
  summarise(count = n() )
```

```
## # A tibble: 2 x 2
##   hotel        count
##   <chr>        <int>
## 1 City Hotel   79330
## 2 Resort Hotel 40060
```

24. summarise() for multiple summary statistics (Slide #67)

```
# Enter code here
hotels %>%
  summarise(
    min_adr = min(adr),
    mean_adr = mean(adr),
    median_adr = median(adr),
    max_adr = max(adr)
  )
```

```
## # A tibble: 1 x 4
##   min_adr mean_adr median_adr max_adr
##     <dbl>    <dbl>      <dbl>   <dbl>
## 1   -6.38     102.       94.6    5400
```

25. select(), slice() and arrange() (Slide #68)

```
# Enter code here
hotels %>%
  select(hotel, lead_time) %>%
  slice(1:5) %>%
  arrange(lead_time)
```

```
## # A tibble: 5 x 2
##   hotel        lead_time
##   <chr>            <dbl>
## 1 Resort Hotel         7
## 2 Resort Hotel        13
## 3 Resort Hotel        14
## 4 Resort Hotel       342
## 5 Resort Hotel       737
```

26. select(), arrange() and slice() (Slide #69)

```
# Enter code here
hotels %>%
  select(hotel, lead_time) %>%
  arrange(lead_time) %>%
  slice(1:5)
```

```
## # A tibble: 5 x 2
##   hotel        lead_time
##   <chr>            <dbl>
## 1 Resort Hotel         0
## 2 Resort Hotel         0
## 3 Resort Hotel         0
## 4 Resort Hotel         0
## 5 Resort Hotel         0
```

27. filter() to select rows based on conditions (Slide #73)

```r
# Enter code here
hotels %>%
  filter(adults == 0,
         children >= 1) %>%
  select(adults, babies, children)
```

```
## # A tibble: 223 x 3
##    adults babies children
##     <dbl>  <dbl>    <dbl>
##  1      0      0        3
##  2      0      0        2
##  3      0      0        2
##  4      0      0        2
##  5      0      0        2
##  6      0      0        3
##  7      0      1        2
##  8      0      0        2
##  9      0      0        2
## 10      0      0        2
## # i 213 more rows
```

28. filter() to select rows based on complicated conditions (Slide #74)

```r
# Enter code here
hotels %>%
  filter(adults == 0,
         children >= 1 | babies >= 1) %>%
  select(adults, babies, children)
```

```
## # A tibble: 223 x 3
##    adults babies children
##     <dbl>  <dbl>    <dbl>
##  1      0      0        3
##  2      0      0        2
##  3      0      0        2
##  4      0      0        2
##  5      0      0        2
##  6      0      0        3
##  7      0      1        2
##  8      0      0        2
##  9      0      0        2
## 10      0      0        2
## # i 213 more rows
```

29. count() and arrange() (Slide #76)

```
# Enter code here
hotels %>%
  count(market_segment) %>%
  arrange(desc(n))
```

```
## # A tibble: 8 x 2
##   market_segment      n
##   <chr>           <int>
## 1 Online TA       56477
## 2 Offline TA/TO   24219
## 3 Groups          19811
## 4 Direct          12606
## 5 Corporate        5295
## 6 Complementary     743
## 7 Aviation          237
## 8 Undefined           2
```

30. mutate(), select() and arrange() (Slide #77)

```
# Enter code here
hotels %>%
  mutate(little_ones = children + babies) %>%
  select(children, babies, little_ones) %>%
  arrange(desc(little_ones))
```

```
## # A tibble: 119,390 x 3
##    children babies little_ones
##       <dbl>  <dbl>       <dbl>
## 1        10      0          10
## 2         0     10          10
## 3         0      9           9
## 4         2      1           3
## 5         2      1           3
## 6         2      1           3
## 7         3      0           3
## 8         2      1           3
## 9         2      1           3
## 10        3      0           3
## # i 119,380 more rows
```

31. mutate(), filter() and select() (Slide #78)

```
# Enter code here
hotels %>%
  mutate(little_ones = children + babies) %>%
    filter(little_ones >= 1,
           hotel == "Resort Hotel") %>%
      select(hotel, little_ones)
```

```
## # A tibble: 3,929 x 2
##    hotel        little_ones
##    <chr>              <dbl>
##  1 Resort Hotel           1
##  2 Resort Hotel           2
##  3 Resort Hotel           2
##  4 Resort Hotel           2
##  5 Resort Hotel           1
##  6 Resort Hotel           1
##  7 Resort Hotel           2
##  8 Resort Hotel           2
##  9 Resort Hotel           1
## 10 Resort Hotel           1
## # i 3,919 more rows
```