Hotel Bookings Project

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Hotel Bookings: Practice Analysis

Setting up my environment

Notes: *setting up my environment by loading* `tidyverse` *package and my hotel bookings file*

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr   1.0.7
## v tidyr   1.1.4     v stringr 1.4.0
## v readr   2.1.1     v forcats 0.5.1
```

```
## Warning: package 'tibble' was built under R version 4.1.2
```

```
## Warning: package 'readr' was built under R version 4.1.2
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
hotel_bookings <- read_csv("hotel_bookings.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.
```

Cleaning my data

- Head
- Structure
- Glimpse
- Column names

```
head(hotel_bookings)
```

```
## # A tibble: 6 x 32
##   hotel        is_canceled lead_time arrival_date_ye~ arrival_date_mo~ arrival_date_we~
##   <chr>              <dbl>     <dbl>            <dbl> <chr>                       <dbl>
## 1 Resort Hotel           0       342             2015 July                           27
## 2 Resort Hotel           0       737             2015 July                           27
## 3 Resort Hotel           0         7             2015 July                           27
## 4 Resort Hotel           0        13             2015 July                           27
## 5 Resort Hotel           0        14             2015 July                           27
## 6 Resort Hotel           0        14             2015 July                           27
## # ... with 26 more variables: 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>, booking_changes <dbl>,
## #   deposit_type <chr>, agent <chr>, company <chr>, ...
```

```
str(hotel_bookings)
```

```
## spec_tbl_df [119,390 x 32] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ hotel                         : chr [1:119390] "Resort Hotel" "Resort Hotel" "Resort Hotel" "Reso
##  $ is_canceled                   : num [1:119390] 0 0 0 0 0 0 0 0 1 1 ...
##  $ lead_time                     : num [1:119390] 342 737 7 13 14 14 0 9 85 75 ...
##  $ arrival_date_year             : num [1:119390] 2015 2015 2015 2015 2015 ...
##  $ arrival_date_month            : chr [1:119390] "July" "July" "July" "July" ...
##  $ arrival_date_week_number      : num [1:119390] 27 27 27 27 27 27 27 27 27 27 ...
##  $ arrival_date_day_of_month     : num [1:119390] 1 1 1 1 1 1 1 1 1 1 ...
##  $ stays_in_weekend_nights       : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ stays_in_week_nights          : num [1:119390] 0 0 1 1 2 2 2 2 3 3 ...
##  $ adults                        : num [1:119390] 2 2 1 1 2 2 2 2 2 2 ...
##  $ children                      : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ babies                        : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ meal                          : chr [1:119390] "BB" "BB" "BB" "BB" ...
##  $ country                       : chr [1:119390] "PRT" "PRT" "GBR" "GBR" ...
##  $ market_segment                : chr [1:119390] "Direct" "Direct" "Direct" "Corporate" ...
##  $ distribution_channel          : chr [1:119390] "Direct" "Direct" "Direct" "Corporate" ...
##  $ is_repeated_guest             : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ previous_cancellations        : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ previous_bookings_not_canceled: num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ reserved_room_type            : chr [1:119390] "C" "C" "A" "A" ...
##  $ assigned_room_type            : chr [1:119390] "C" "C" "C" "A" ...
##  $ booking_changes               : num [1:119390] 3 4 0 0 0 0 0 0 0 0 ...
##  $ deposit_type                  : chr [1:119390] "No Deposit" "No Deposit" "No Deposit" "No Deposit
##  $ agent                         : chr [1:119390] "NULL" "NULL" "NULL" "304" ...
##  $ company                       : chr [1:119390] "NULL" "NULL" "NULL" "NULL" ...
##  $ days_in_waiting_list          : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ customer_type                 : chr [1:119390] "Transient" "Transient" "Transient" "Transient" ..
##  $ adr                           : num [1:119390] 0 0 75 75 98 ...
##  $ required_car_parking_spaces   : num [1:119390] 0 0 0 0 0 0 0 0 0 0 ...
##  $ total_of_special_requests     : num [1:119390] 0 0 0 0 1 1 0 1 1 0 ...
##  $ reservation_status            : chr [1:119390] "Check-Out" "Check-Out" "Check-Out" "Check-Out" ..
##  $ reservation_status_date       : Date[1:119390], format: "2015-07-01" "2015-07-01" ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   hotel = col_character(),
```

```
##   ..   is_canceled = col_double(),
##   ..   lead_time = col_double(),
##   ..   arrival_date_year = col_double(),
##   ..   arrival_date_month = col_character(),
##   ..   arrival_date_week_number = col_double(),
##   ..   arrival_date_day_of_month = col_double(),
##   ..   stays_in_weekend_nights = col_double(),
##   ..   stays_in_week_nights = col_double(),
##   ..   adults = col_double(),
##   ..   children = col_double(),
##   ..   babies = col_double(),
##   ..   meal = col_character(),
##   ..   country = col_character(),
##   ..   market_segment = col_character(),
##   ..   distribution_channel = col_character(),
##   ..   is_repeated_guest = col_double(),
##   ..   previous_cancellations = col_double(),
##   ..   previous_bookings_not_canceled = col_double(),
##   ..   reserved_room_type = col_character(),
##   ..   assigned_room_type = col_character(),
##   ..   booking_changes = col_double(),
##   ..   deposit_type = col_character(),
##   ..   agent = col_character(),
##   ..   company = col_character(),
##   ..   days_in_waiting_list = col_double(),
##   ..   customer_type = col_character(),
##   ..   adr = col_double(),
##   ..   required_car_parking_spaces = col_double(),
##   ..   total_of_special_requests = col_double(),
##   ..   reservation_status = col_character(),
##   ..   reservation_status_date = col_date(format = "")
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
glimpse(hotel_bookings)
```

```
## 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~
```

```
colnames(hotel_bookings)
```

```
##  [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"
```

Arranging my data

```
arrange(hotel_bookings, 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
## # ... with 119,380 more rows, and 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>, ...
```

```
arrange(hotel_bookings, -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
## # ... with 119,380 more rows, and 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>, ...
```

```
arrange(hotel_bookings, 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
## # ... with 119,380 more rows, and 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>, ...
```

Analyzing my data

```
hotel_bookings %>%
group_by(hotel) %>%
summarise(average_lead_time=mean(lead_time),
          min_lead_time=min(lead_time),
```

```
          max_lead_time=max(lead_time))
```

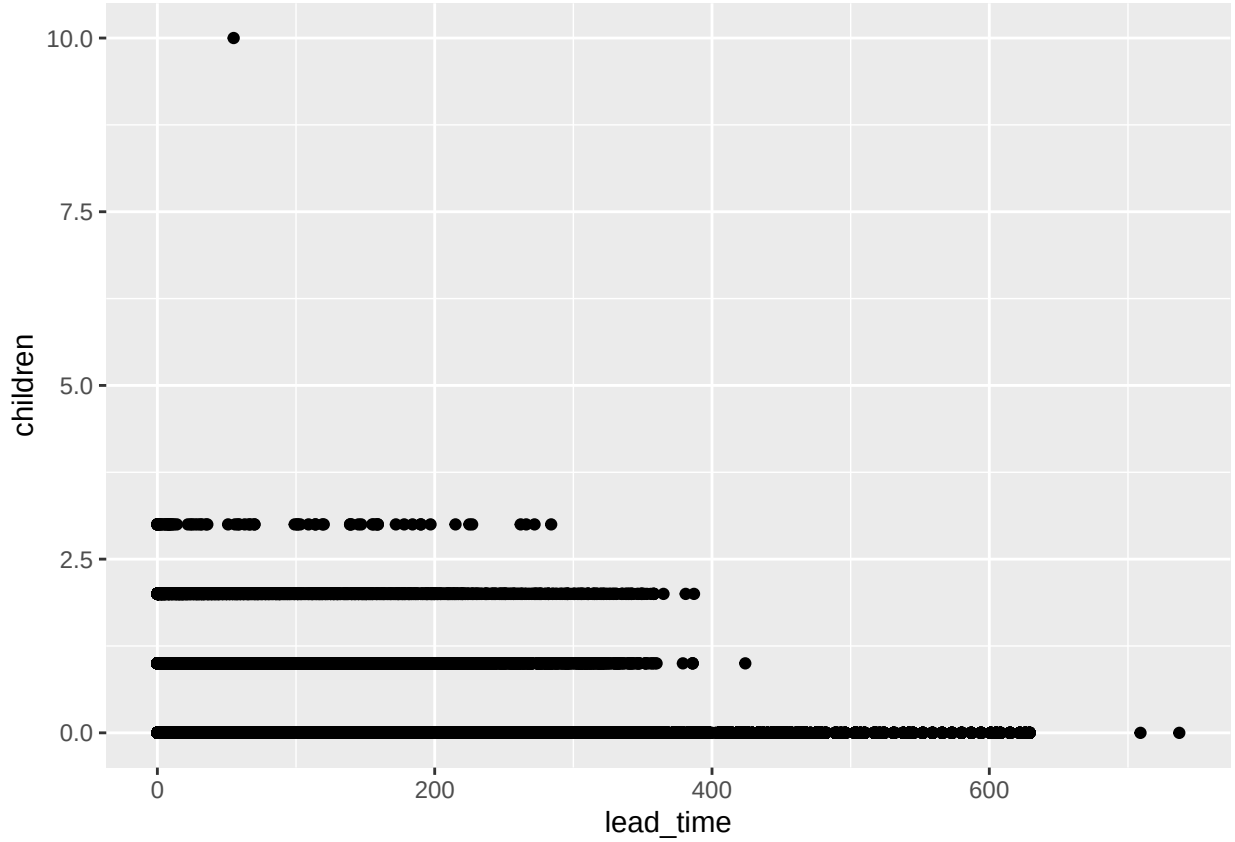
```
## # A tibble: 2 x 4
##   hotel        average_lead_time min_lead_time max_lead_time
##   <chr>                    <dbl>         <dbl>         <dbl>
## 1 City Hotel               110.              0           629
## 2 Resort Hotel              92.7             0           737
```

```
min_date <- min(hotel_bookings$arrival_date_year)
max_date <- max(hotel_bookings$arrival_date_year)
```

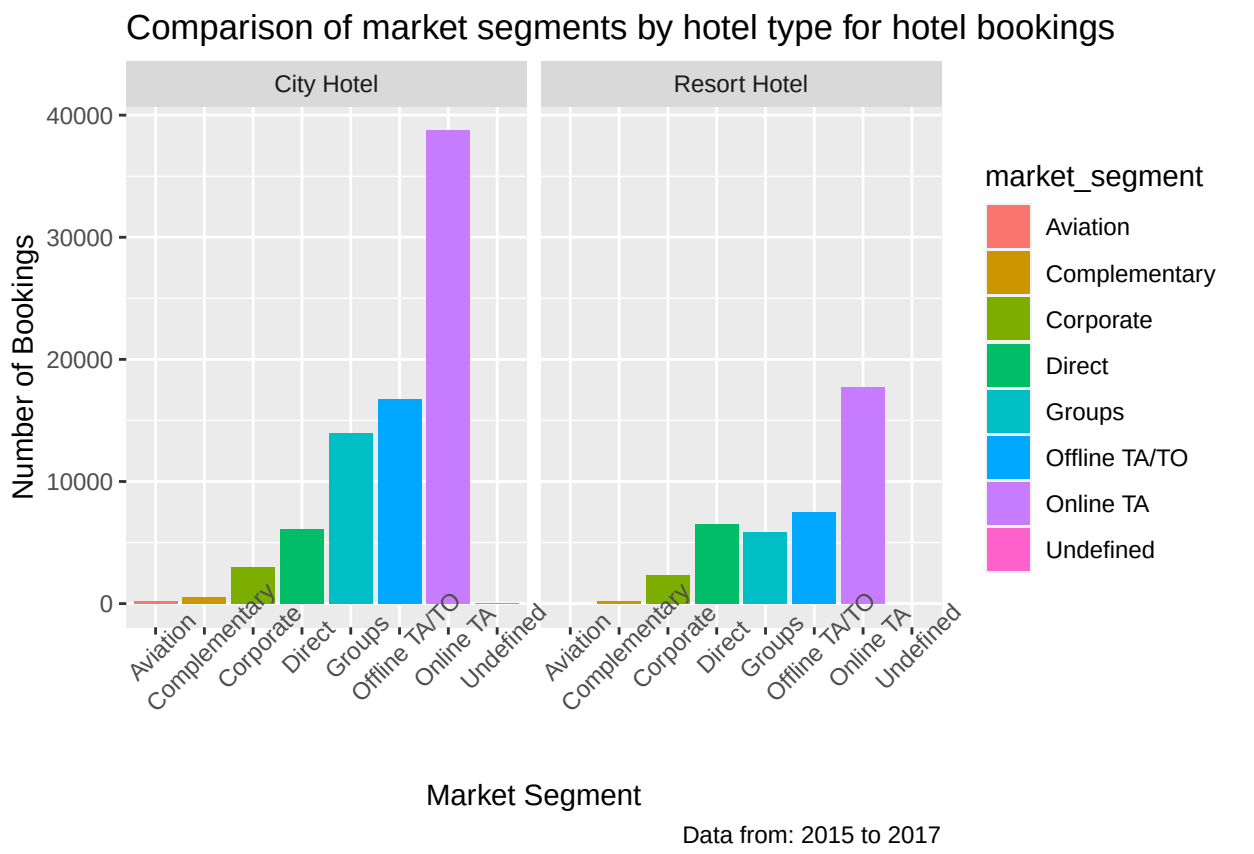
Plotting my data

```
ggplot(data = hotel_bookings) +
  geom_point(mapping= aes(x=lead_time, y=children))
```

```
## Warning: Removed 4 rows containing missing values (geom_point).
```




```
ggplot(data = hotel_bookings) +
  geom_bar(mapping = aes(x = market_segment, fill=market_segment)) +
  facet_wrap(~hotel) +
  theme(axis.text.x = element_text(angle = 45)) +
  labs(title="Comparison of market segments by hotel type for hotel bookings",
       caption = paste0("Data from: ", min_date, " to ", max_date),
       x = "Market Segment",
       y = "Number of Bookings")
```




```
# Saving my data in png format
ggsave("hotel_bookings_chart.png", width = 7, height = 7)
```