Hotels

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```
library(tidyverse)
library(infer)
```

```
hotel_bookings <- read.csv("~/R/DIIG/hotel_bookings.csv")
```

First, I made some new variables and did some data cleaning:

New variable for total amount of nights stayed:

```
hotel_bookings <- hotel_bookings %>%
  mutate(total_nights = stays_in_week_nights + stays_in_weekend_nights)
```

Changing the month of arrival into chronologically-ordered levels:

```
hotel_bookings <- hotel_bookings %>%
  mutate(arrival_date_month = factor(arrival_date_month,
                                     levels = c("January", "February", "March", "April", "May",
                                                "June", "July", "August", "September",
                                                "October", "November", "December")))
```

I also changed the is_canceled variable from numeric to categorical, as 0 and 1 represent a booking being cancelled or not.

```
hotel_bookings$is_canceled <- as.factor(hotel_bookings$is_canceled)
```

I created a variable for the total number of guests during the duration of the stay:

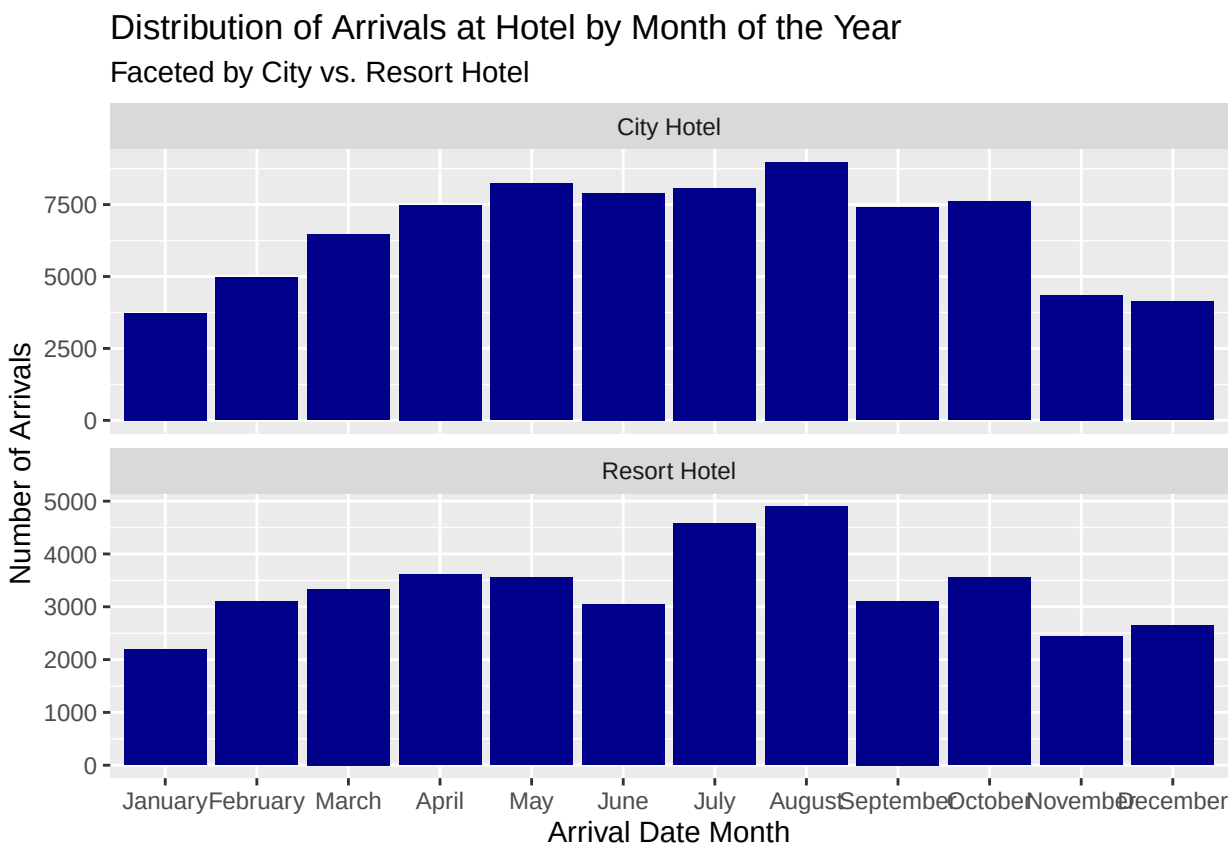
```
hotel_bookings <- hotel_bookings %>%
  mutate(total_guests = adults + children + babies)
```

```
hotel_bookings <- hotel_bookings %>%
  mutate(arrival_season = case_when(arrival_date_month == "December" ~ "Winter",
                                    arrival_date_month == "January" ~ "Winter",
                                    arrival_date_month == "February" ~ "Winter",
                                    arrival_date_month == "September" ~ "Fall",
                                    arrival_date_month == "October" ~ "Fall",
                                    arrival_date_month == "November" ~ "Fall",
                                    arrival_date_month == "March" ~ "Spring",
                                    arrival_date_month == "April" ~ "Spring",
                                    arrival_date_month == "May" ~ "Spring",
                                    arrival_date_month == "June" ~ "Summer",
                                    arrival_date_month =="July" ~ "Summer",
                                    arrival_date_month =="August" ~ "Summer"))
```

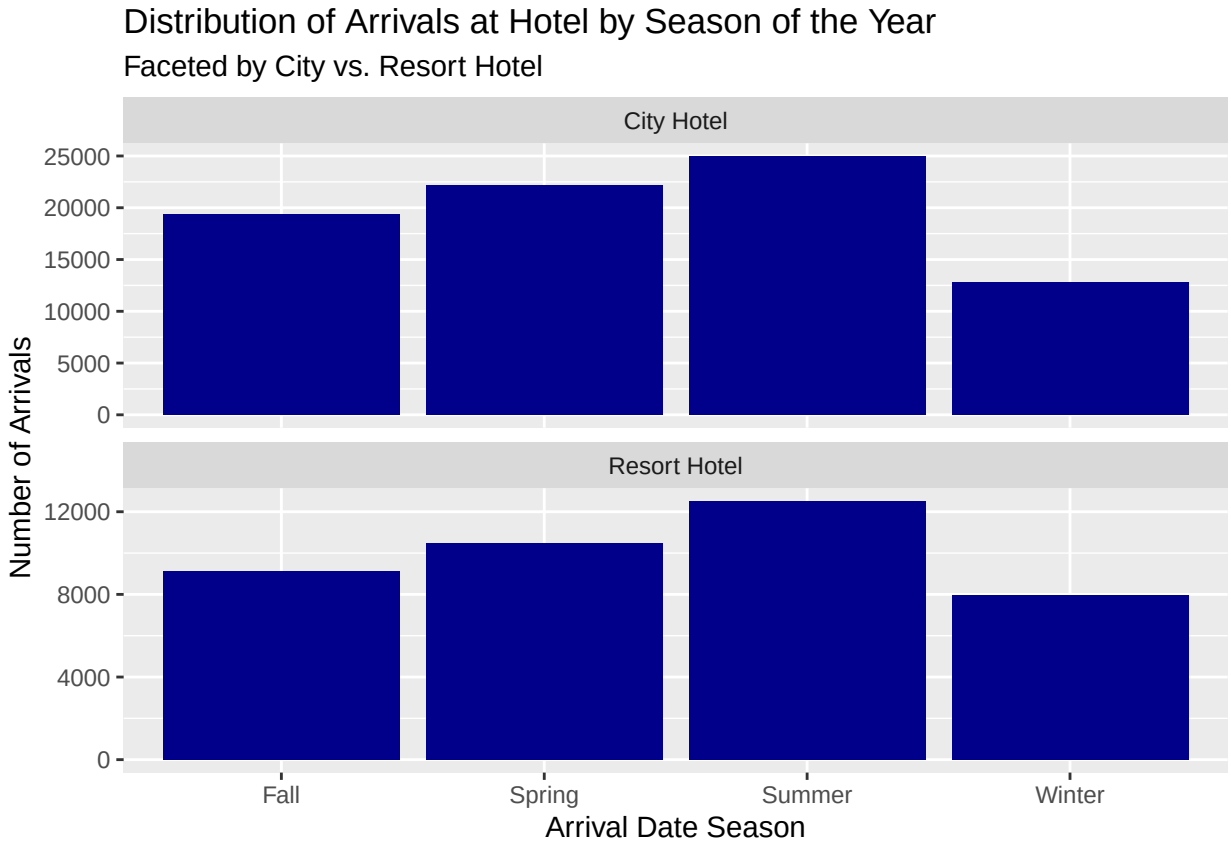
Next, I visualized the distribution of visits to the hotels based on month of the year, to find that there was an increase in volume of arrivals in the warmer months.

```
hotel_bookings %>%
  group_by(hotel, arrival_date_month) %>%
```

```
  ggplot(aes(x = arrival_date_month)) +
  geom_bar(fill = "darkblue") +
  facet_wrap(~ hotel,
             nrow = 2,
             scales = "free_y") +
  labs(title = "Distribution of Arrivals at Hotel by Month of the Year",
       subtitle = "Faceted by City vs. Resort Hotel",
       x = "Arrival Date Month",
       y = "Number of Arrivals")
```

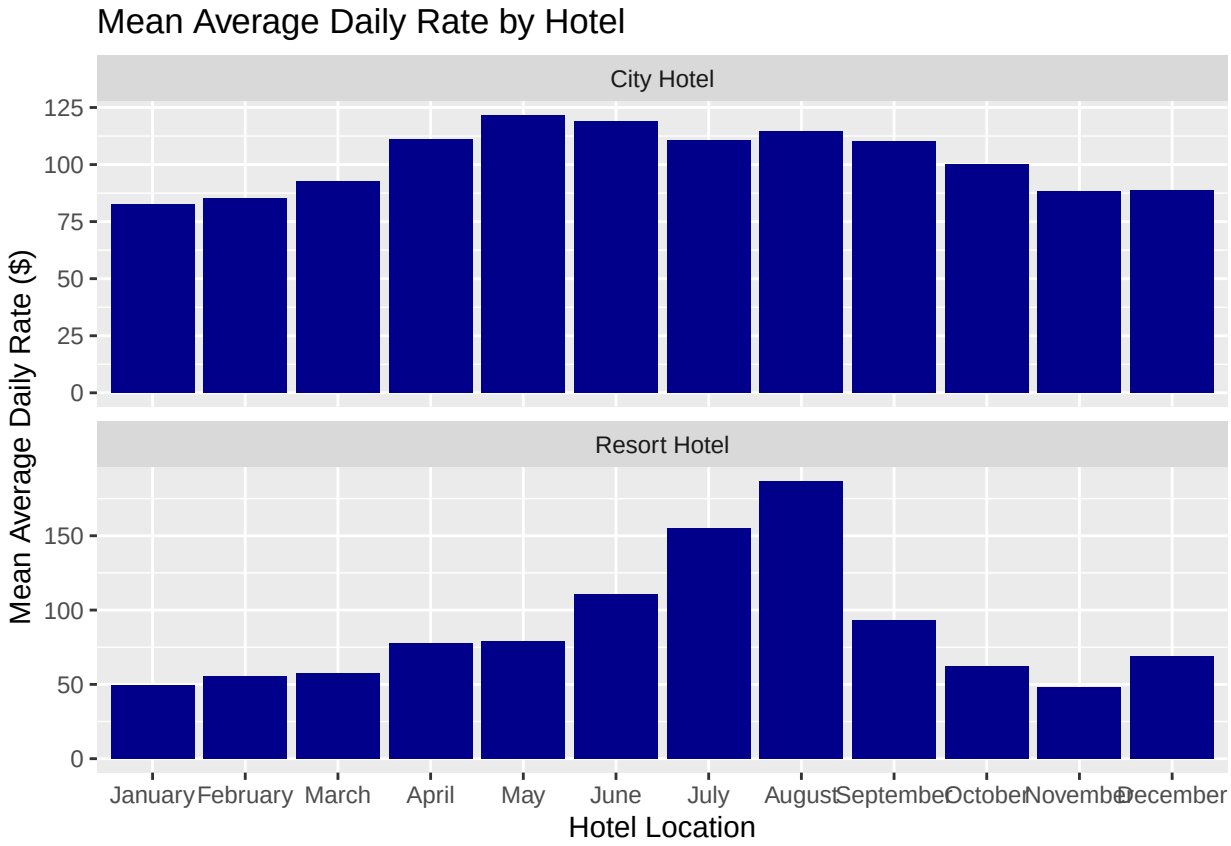



```
hotel_bookings %>%
  group_by(hotel, arrival_season) %>%
  ggplot(aes(x = arrival_season)) +
  geom_bar(fill = "darkblue") +
  facet_wrap(~ hotel,
             nrow = 2,
             scales = "free_y") +
  labs(title = "Distribution of Arrivals at Hotel by Season of the Year",
       subtitle = "Faceted by City vs. Resort Hotel",
       x = "Arrival Date Season",
       y = "Number of Arrivals")
```




```
hotel_bookings %>%
  group_by(hotel, arrival_date_month) %>%
  summarise(meanadr = mean(adr)) %>%
  ggplot(aes(x = arrival_date_month, y = meanadr)) +
  geom_col(fill = "darkblue") +
  facet_wrap(~ hotel, nrow = 2, scales = "free_y") +
  labs(title = "Mean Average Daily Rate by Hotel",
       x = "Hotel Location",
       y = "Mean Average Daily Rate ($)")
```

```
## `summarise()` regrouping output by 'hotel' (override with `.groups` argument)
```



For this data challenge, I'll mainly be focusing on Resort Hotels, so I filtered the "City Hotels" out of my dataset.

```
resort_bookings <- hotel_bookings %>%
  filter(hotel == "Resort Hotel")
```

How does having kids influence rates?

```
resort_bookings %>%
  group_by(arrival_season) %>%
  summarise(meanadr = mean(adr))
```

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

```
## # A tibble: 4 x 2
##   arrival_season meanadr
##   <chr>            <dbl>
## 1 Fall              69.0
## 2 Spring            71.7
## 3 Summer           157.
## 4 Winter            58.2
```

```
logit_mod1 <- glm(is_canceled ~ arrival_date_month + total_nights,
                  data = resort_bookings, family = "binomial", maxit = 100)
```

```
logit_mod2 <- glm(is_canceled ~ adults + children + babies + meal,
                  data = resort_bookings, family = "binomial", maxit = 100)

logit_mod2
```

```
##
## Call:  glm(formula = is_canceled ~ adults + children + babies + meal,
##     family = "binomial", data = resort_bookings, maxit = 100)
##
## Coefficients:
##   (Intercept)         adults       children         babies         mealFB
##      -1.85054        0.41463        0.32996       -0.64143        1.36302
##        mealHB         mealSC  mealUndefined
##       0.22745       -2.19245       -0.05317
##
## Degrees of Freedom: 40059 Total (i.e. Null);  40052 Residual
## Null Deviance:       47330
## Residual Deviance: 46310     AIC: 46330
```

```
logit_mod3 <- glm(is_canceled ~ adr + required_car_parking_spaces + total_of_special_requests,
                  data = resort_bookings, family = "binomial", maxit = 100)
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```