

# Assignment 6: Bike Sharing Washington

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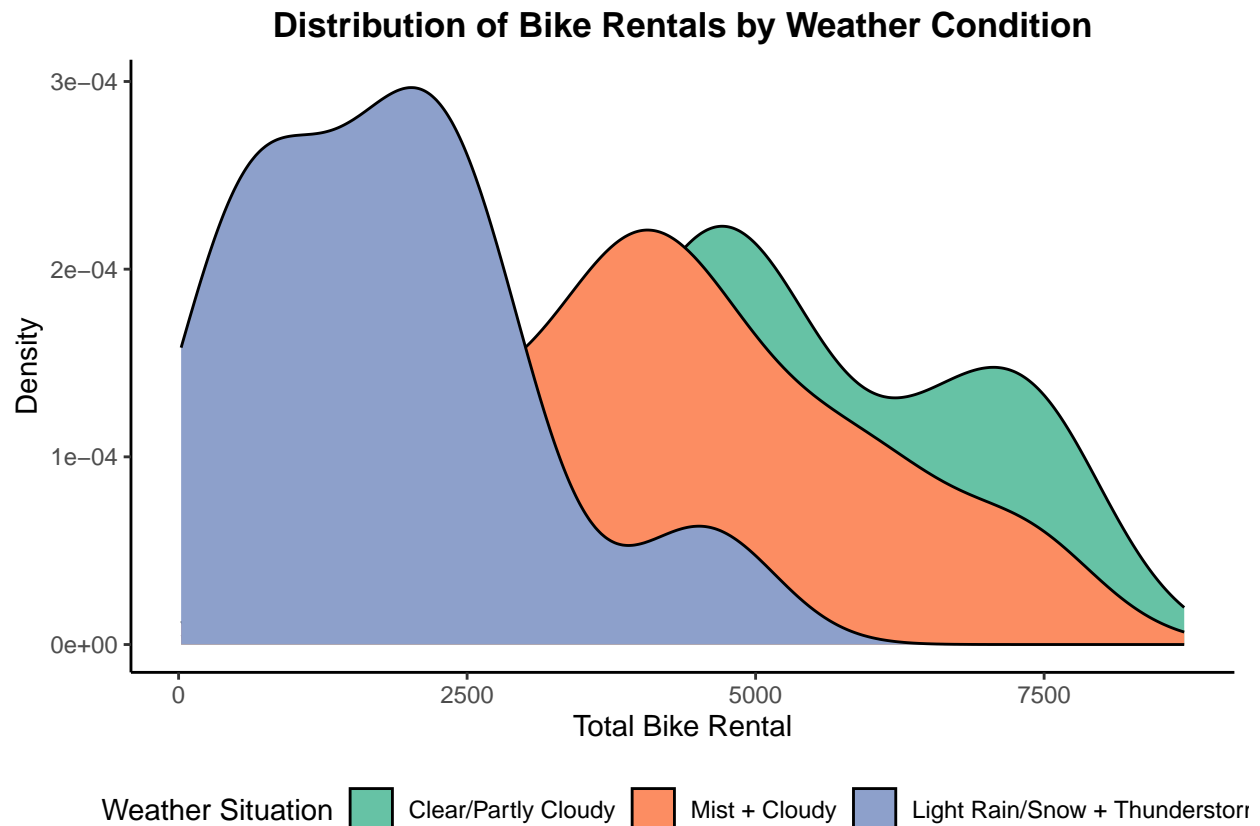
Sep 31, 2025

```
bikes <- read.csv("Data/Bikes_Washington.csv")
```

Task A

```
bikes$weather_lbs <- factor(bikes$weathersit,
                           levels = c(1, 2, 3),
                           labels = c("Clear/Partly Cloudy",
                                       "Mist + Cloudy",
                                       "Light Rain/Snow + Thunderstorm"))

ggplot(bikes, aes(x = cnt, fill = weather_lbs)) +
  geom_density() +
  scale_fill_brewer(palette = "Set2") +
  labs(title = "Distribution of Bike Rentals by Weather Condition", x = "Total Bike Rental",
       y = "Density", fill = "Weather Situation") +
  theme_classic() +
  theme(plot.title = element_text(face = "bold", hjust = 0.5),
        legend.position = "bottom",
        panel.grid.minor = element_blank())
```



#### Task B

```
bikes$dteday <- as.Date(bikes$dteday)

bike_2012 <- bikes %>%
  filter(year(bikes$dteday) == 2012)

#starting jan 2012
bike_2012 <- bike_2012 %>%
  mutate(week_num = as.numeric(ceiling((bike_2012$dteday - as.Date("2012-01-01")) / 7)) + 1)

#by week
weekly_data <- bike_2012 %>%
  group_by(week_num) %>%
  summarize(
    total_cnt = sum(cnt),
    total_casual = sum(casual),
    total_registered = sum(registered)
  ) %>%
  pivot_longer(cols = c(total_cnt, total_casual, total_registered),
    names_to = "user_types",
    values_to = "rentals"
  )

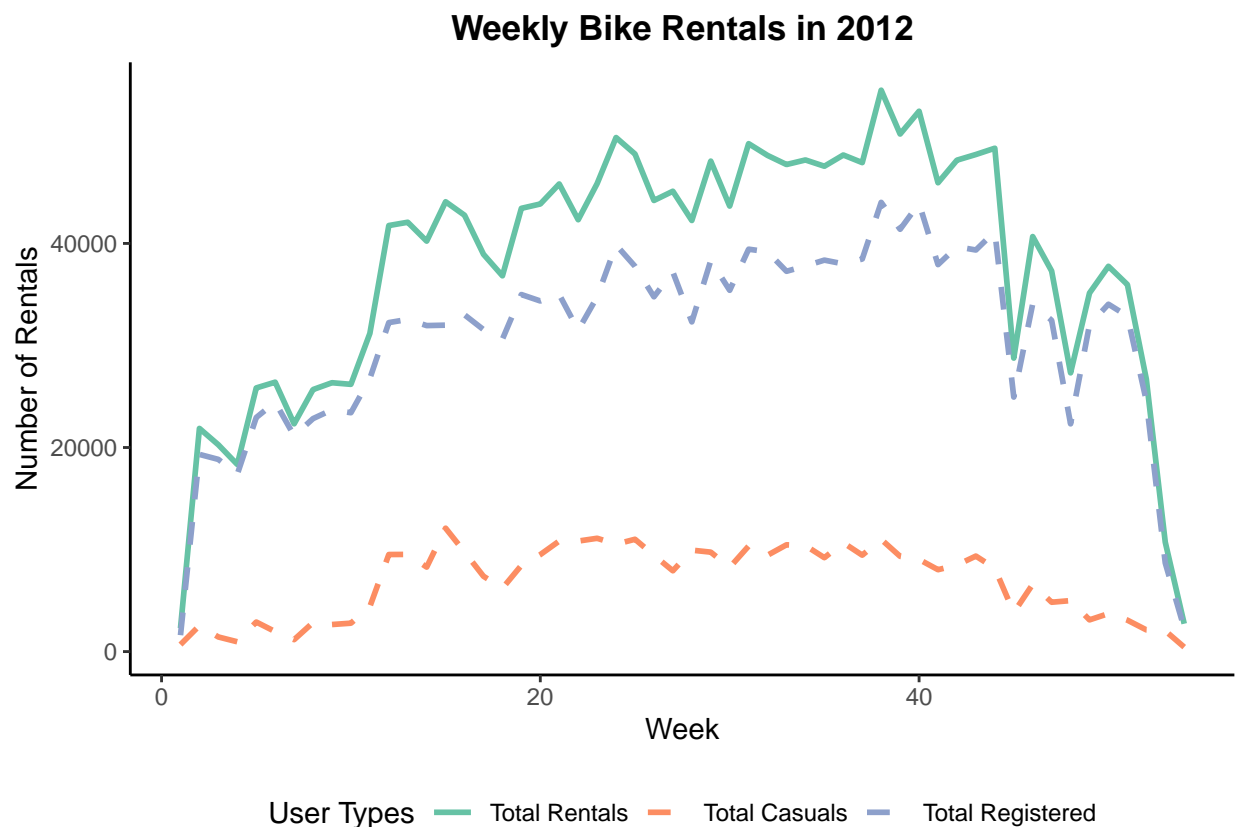
#label
weekly_data$user_types <- factor(weekly_data$user_types,
```

```

        levels = c("total_cnt", "total_casual", "total_registered"),
        labels = c("Total Rentals", "Total Casuals", "Total Registered"))

ggplot(weekly_data, aes(x = week_num, y = rentals, color = user_types, linetype = user_types)) +
  geom_line(linewidth = 1) +
  scale_color_brewer(palette = "Set2", direction = 1) +
  scale_linetype_manual(values = c("Total Rentals" = "solid",
                                   "Total Casuals" = "dashed",
                                   "Total Registered" = "dashed")) +
  labs(title = "Weekly Bike Rentals in 2012", x = "Week", y = "Number of Rentals", color = "User Types")
  theme_classic() +
  theme(plot.title = element_text(face = "bold", hjust = 0.5),
        legend.position = "bottom",
        panel.grid.minor = element_blank())

```



#### Task C

```

#Converting dates first
bikes$dteday <- as.Date(bikes$dteday)

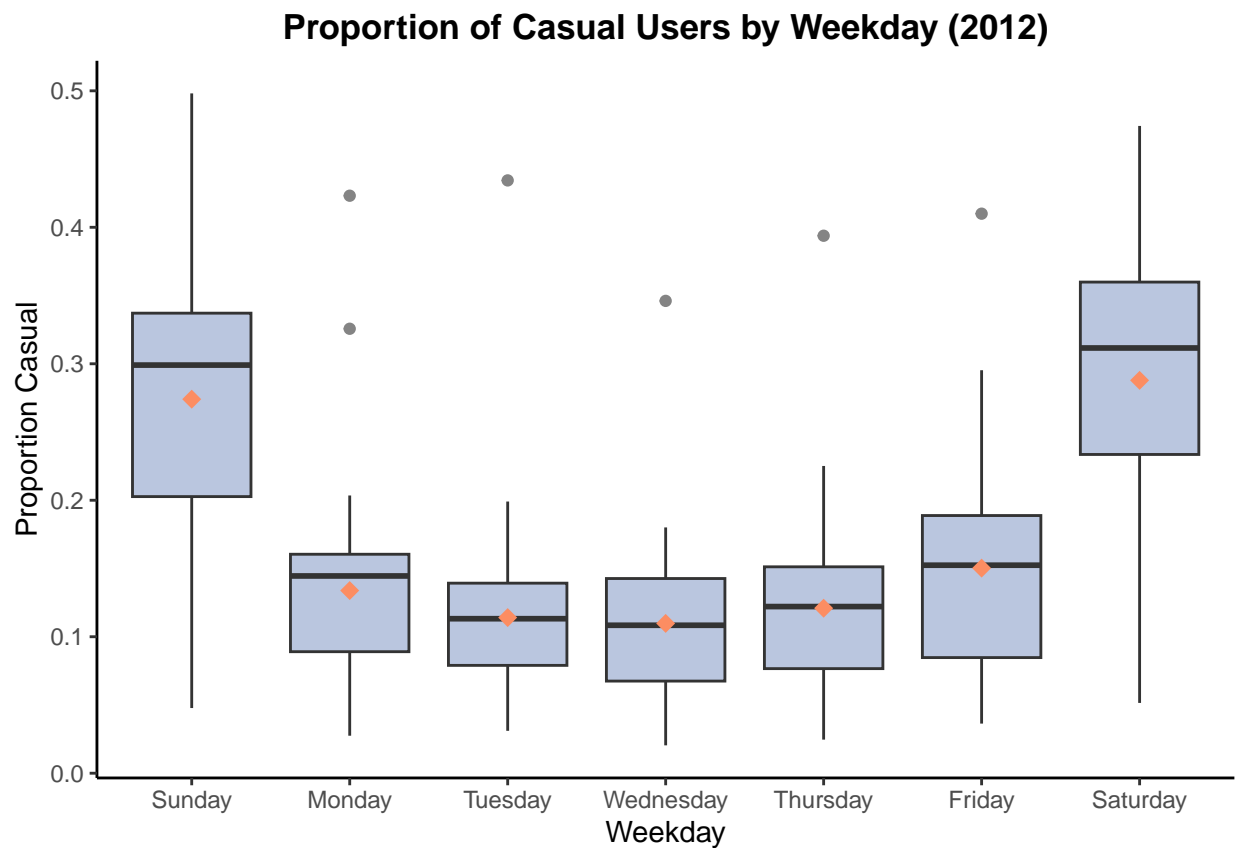
#Restrict to 2012
bikes2012 <- bikes %>%
  filter(year(dteday)==2012)

#The proportion and weekday names
bikes2012 <- bikes2012 %>%

```

```
mutate(prop_casual = casual / cnt, weekday = wday(dteday, label = TRUE, abbr = FALSE))

#The box plot itself
ggplot(bikes2012, aes(x = weekday, y = prop_casual)) +
  geom_boxplot(fill = "#8DA0CB", alpha = 0.6) +
  stat_summary(fun = mean, geom = "point", shape = 18, size = 3, colour = "#FC8D62") +
  labs(title = "Proportion of Casual Users by Weekday (2012)",
       x = "Weekday", y = "Proportion Casual") +
  theme_classic() +
  theme(plot.title = element_text(face = "bold", hjust = 0.5),
        panel.grid.minor = element_blank())
```



Task D

```
#Denomarlize the temp column
bikes$temp_celsius <- bikes$temp * 41

#Scatterplot
cols <- ifelse(bikes$holiday == 1, "#FC8D62", "#8DA0CB")

plot(bikes$temp_celsius, bikes$cnt,
     col = cols,
     pch = 16,
     xlab = "Temperature (Celcius)",
     ylab = "Total Bike Rentals",
     main = "Bike Rentals vs Temperature")
```

```
legend("topleft",  
      legend = c("Holiday", "Non-holiday"),  
      col = c("red", "blue"),  
      pch = 16)
```

