barchart-in-r-2

January 14, 2024

Here we will explore how we can visualize a bar chart in R by ggplot. For this we are making just a demo data of two columns and two observations.

```
[1]: # Load the necessary library
     library(ggplot2)

     # Create a data frame
     data <- data.frame(
       exercise_type = c("Exercise class", "Gym-only workouts"),
       mean_weight_loss = c(3.8, 4.5)
     )
```
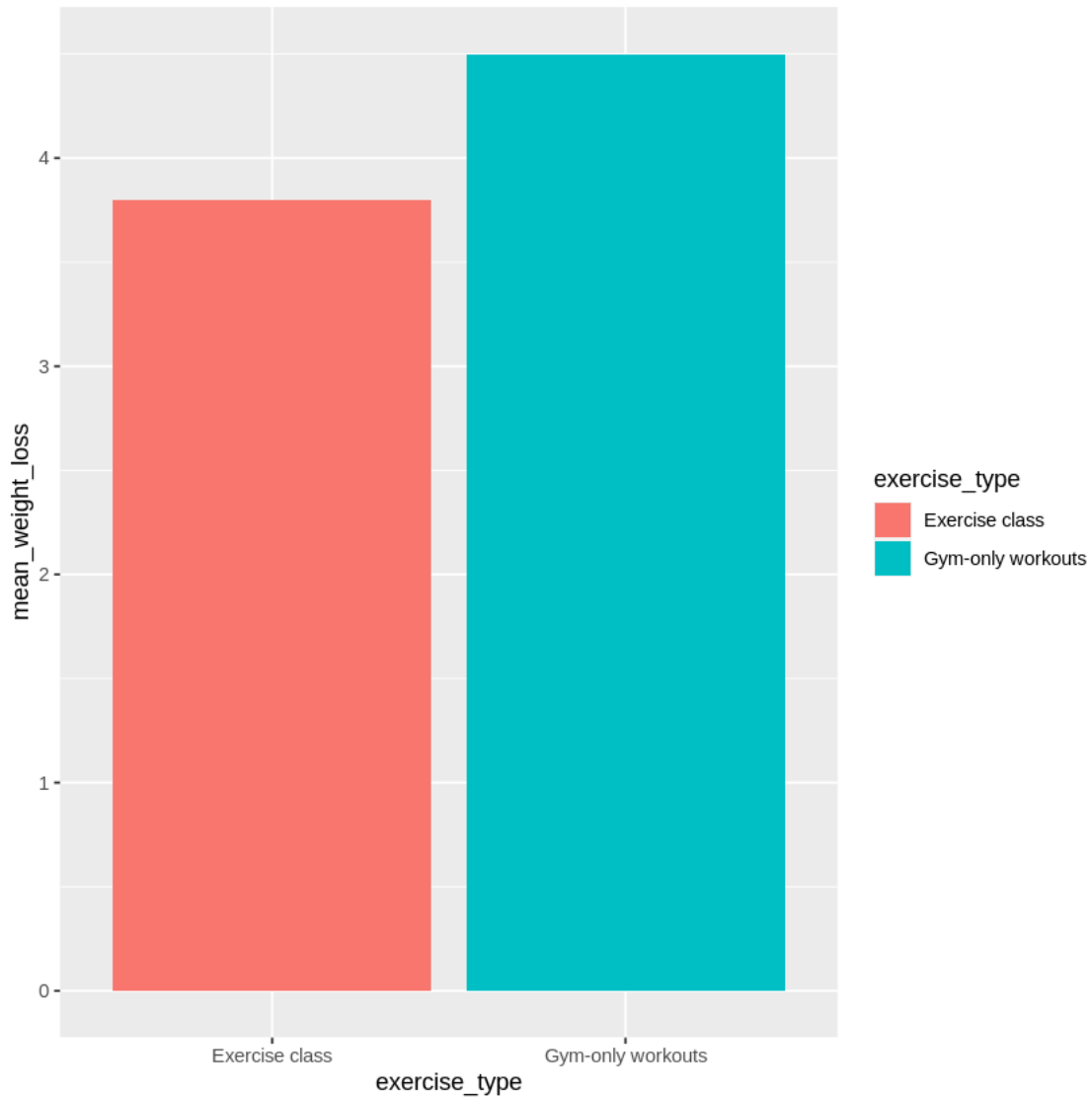
```
[2]: data
```

A data.frame: 2×2

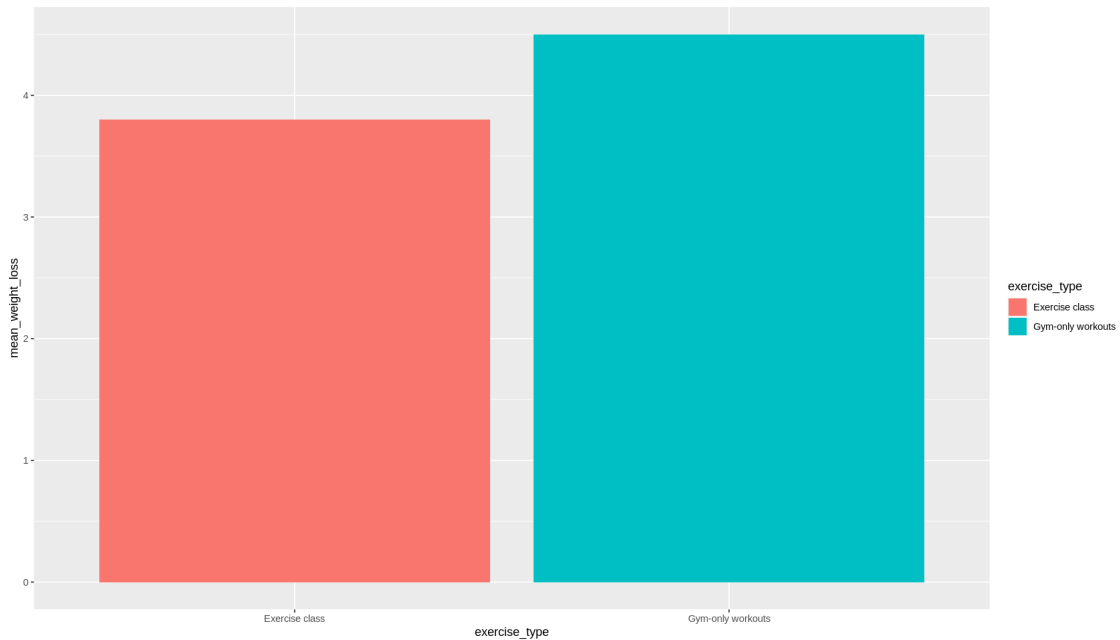| exercise_type	mean_weight_loss
<chr>	<dbl>
Exercise class	3.8
Gym-only workouts	4.5

So now we are doing a very basic bar chart which is by default.

```
[3]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
       geom_bar(stat = "identity")
```

We can change the figure size by adding one line ahead of the main code for chart.

```
[4]: options(repr.plot.width = 14, repr.plot.height = 8)##this is for size
     ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
       ↪exercise_type)) +
       geom_bar(stat = "identity")
```
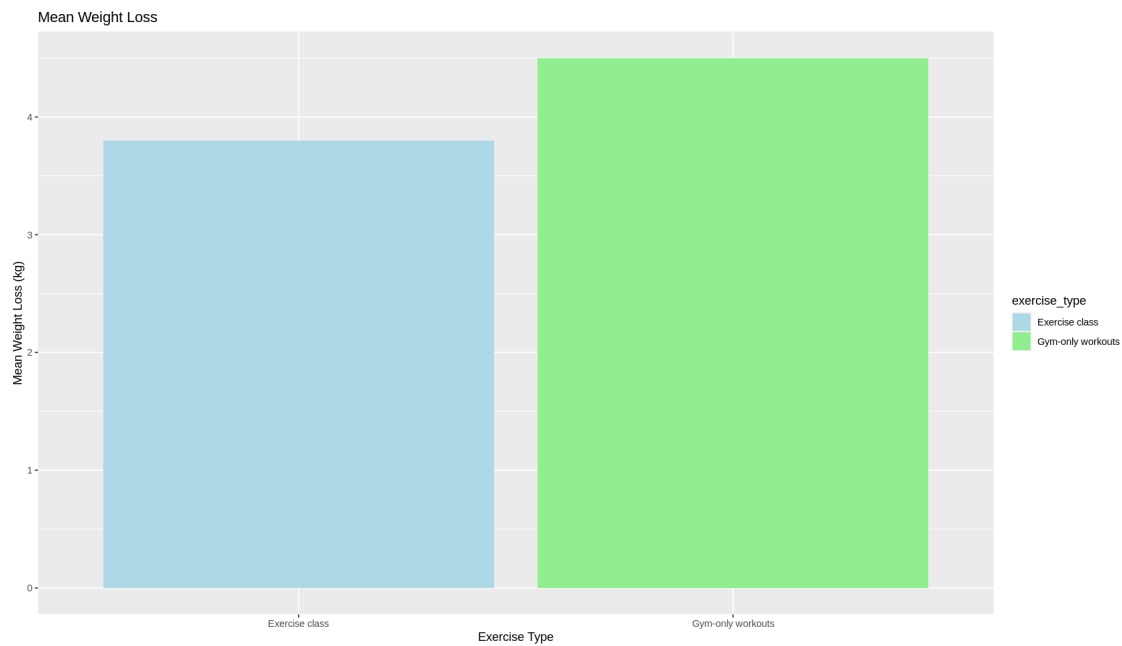
We can customize the colors of bars.

```
[6]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
     ↪exercise_type)) +
     geom_bar(stat = "identity") +
     # Customize colors
     scale_fill_manual(values = c("lightblue", "lightgreen"))
```
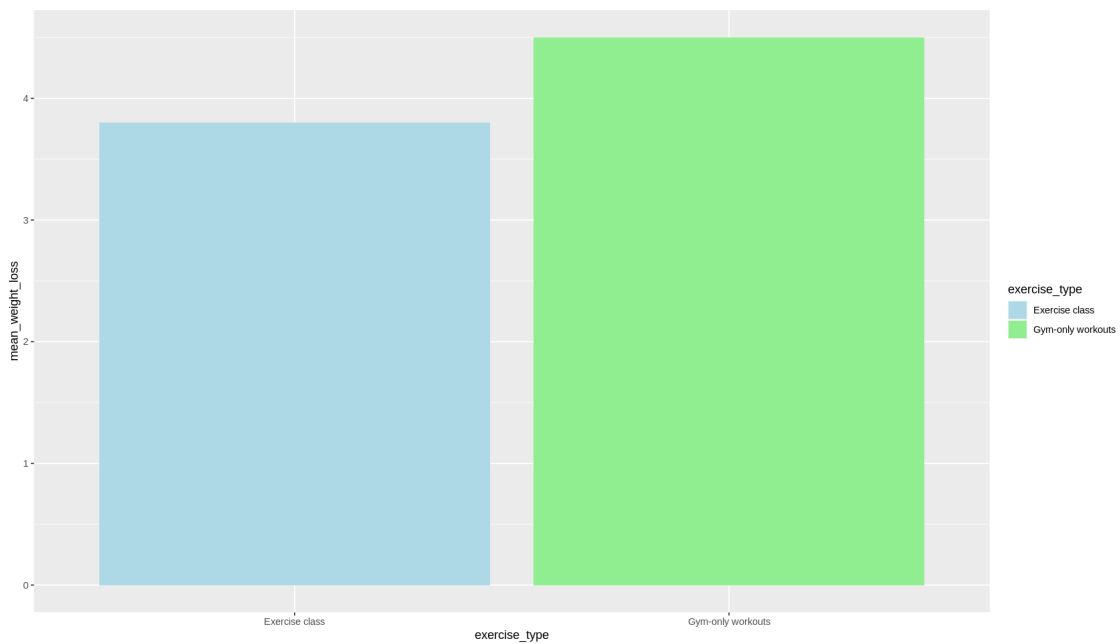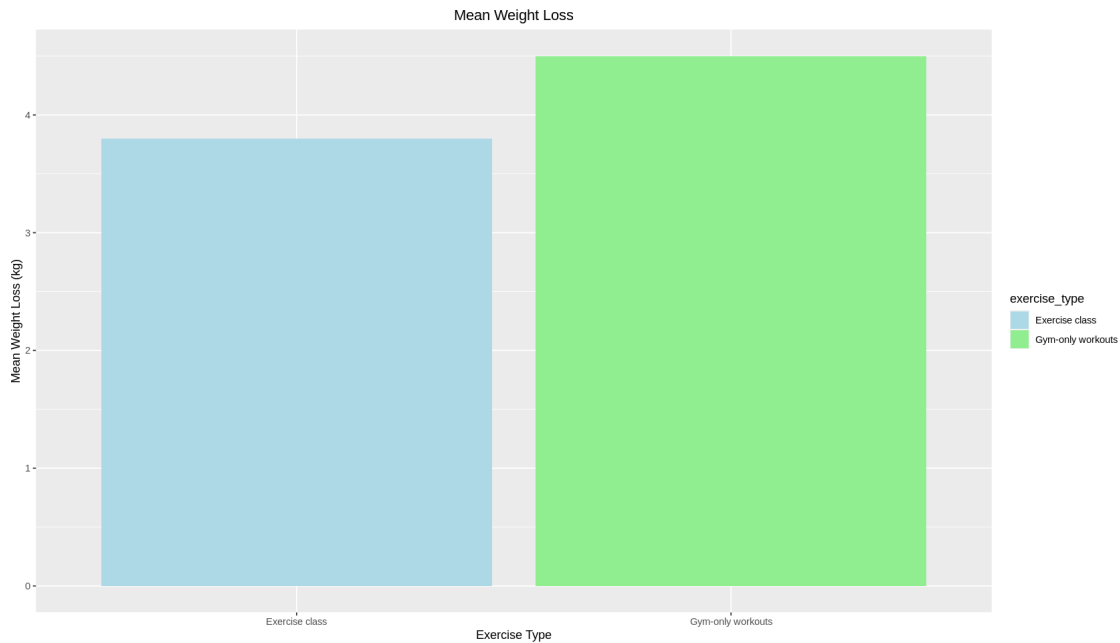
We can add custom title, axis labels.

```
[7]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
     ↪exercise_type)) +
     geom_bar(stat = "identity") +
     #customize titles
     labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
     ↪(kg)") +
     # Customize colors
     scale_fill_manual(values = c("lightblue", "lightgreen"))
```


We can make the title in center.

```
[8]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
     ↪exercise_type)) +
     geom_bar(stat = "identity") +
     #customize titles
     labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
     ↪(kg)") +
     # Customize colors
     scale_fill_manual(values = c("lightblue", "lightgreen"))+
       theme(plot.title = element_text(hjust = 0.5))
```

We can change the size of the titles and axis labels.

```
[10]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =
      ↪exercise_type)) +
       geom_bar(stat = "identity") +
       #customize titles
       labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss
      ↪(kg)") +
       # Customize colors
       scale_fill_manual(values = c("lightblue", "lightgreen"))+
        theme(axis.text.x = element_text(size = 24),
            axis.text.y = element_text(size = 24),
            plot.title = element_text(size = 36, hjust = 0.5))
```
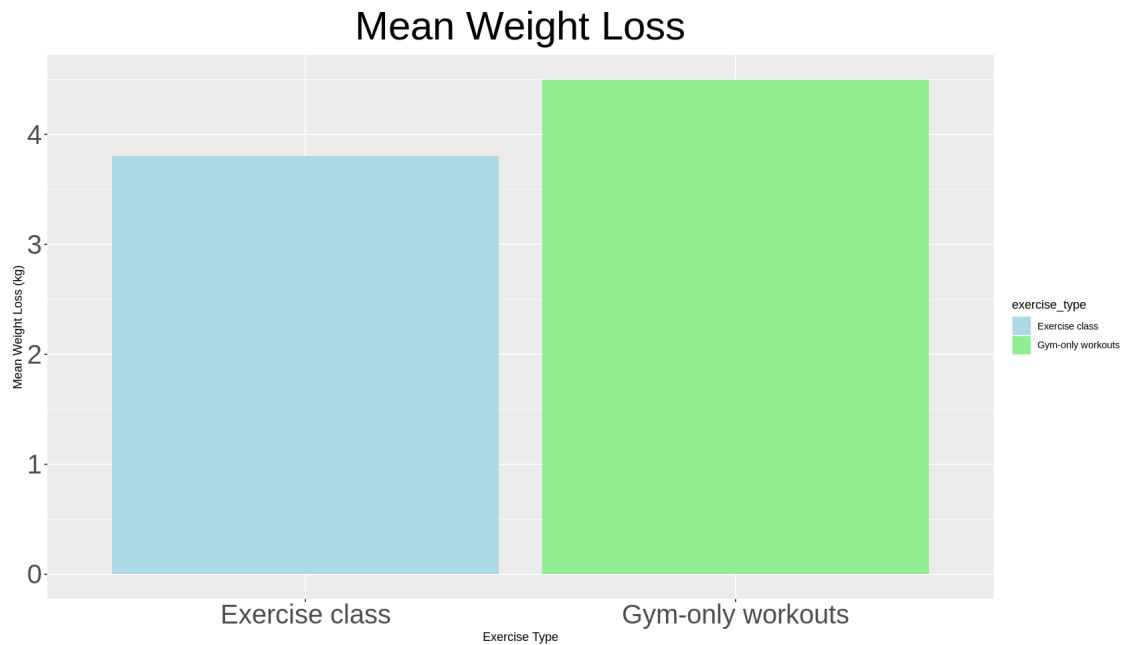
Mean Weight Loss

We can also do changes in font, color etc.

```
[14]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
      geom_bar(stat = "identity") +
      #customize titles
      labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
      ↪(kg)") +
      # Customize colors
      scale_fill_manual(values = c("lightblue", "lightgreen"))+
       theme(axis.text.x = element_text(size = 24, face ="bold", color = "Blue"),
             axis.text.y = element_text(size = 24, face ="bold", color = "Blue"),
             plot.title = element_text(size = 36, hjust = 0.5, face ="bold"))
```
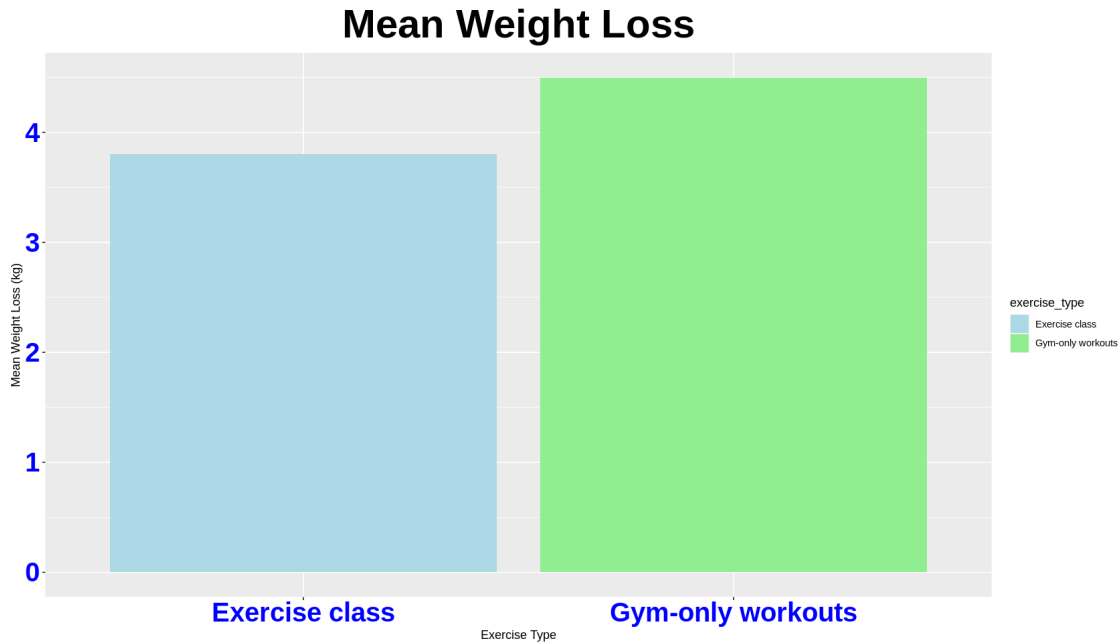
Mean Weight Loss

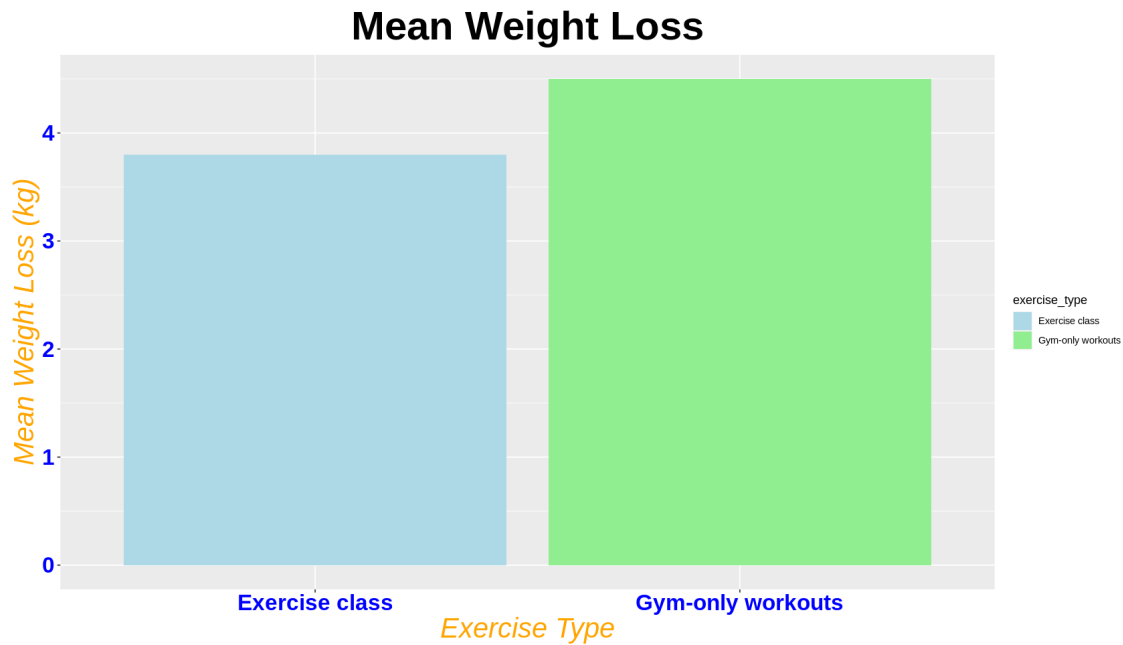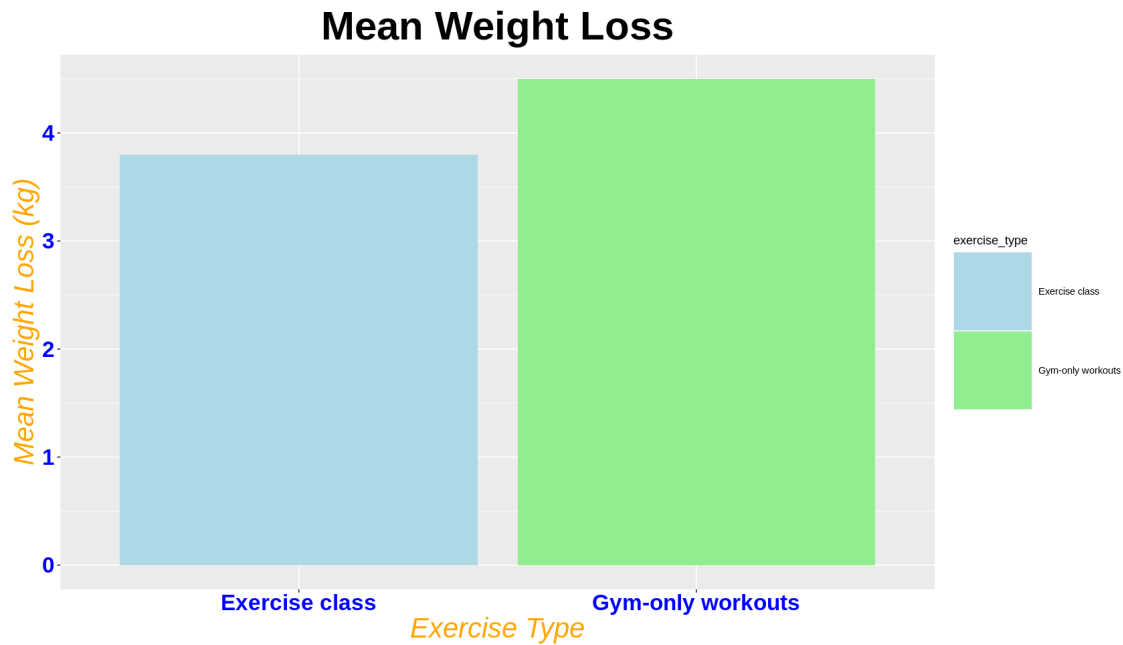We not only can change axis values formatting, also can change in labels formatting also.

```
[16]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
       geom_bar(stat = "identity") +
       #customize titles
       labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
      ↪(kg)") +
       # Customize colors
       scale_fill_manual(values = c("lightblue", "lightgreen"))+
        theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
              axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
              ##for axis labels
              axis.title.x = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
              axis.title.y = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
              plot.title = element_text(size = 36, hjust = 0.5, face ="bold"))
```
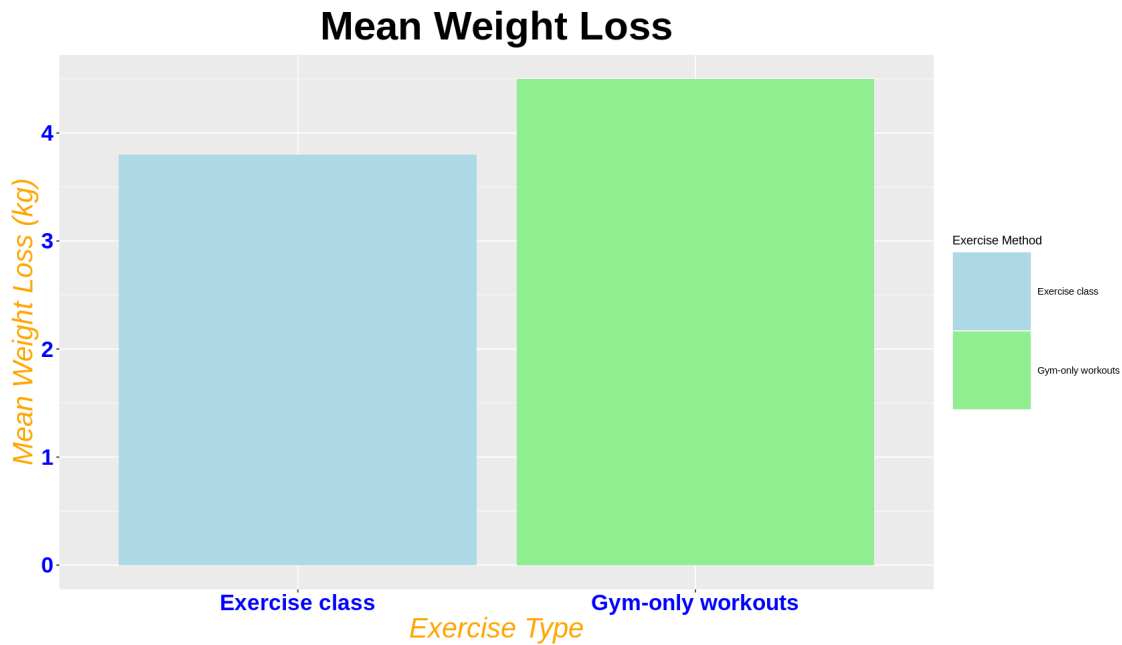
Mean Weight Loss

We can also increase the legend size.

```
[17]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
       geom_bar(stat = "identity") +
       #customize titles
       labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
      ↪(kg)") +
       # Customize colors
       scale_fill_manual(values = c("lightblue", "lightgreen"))+
        theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
             axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
             ##for axis labels
             axis.title.x = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             axis.title.y = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
             ##legend size
             legend.key.size = unit(2.5, "cm"))
```
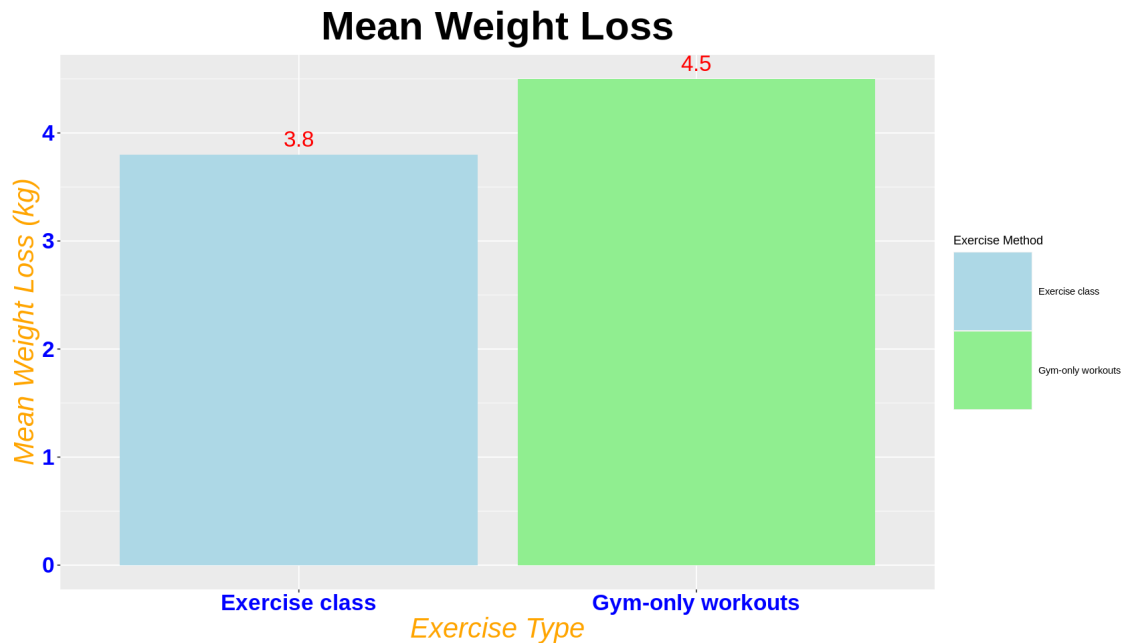
Mean Weight Loss

We can also customize the legends.

```
[18]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
       geom_bar(stat = "identity") +
       #customize titles
       labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
      ↪(kg)") +
         # Customize legend
       guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
      ↪size = 17))+
       # Customize colors
       scale_fill_manual(values = c("lightblue", "lightgreen"))+
        theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
             axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
             ##for axis labels
             axis.title.x = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             axis.title.y = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
             ##legend size
             legend.key.size = unit(2.5, "cm"))
```

Mean Weight Loss

We can add value labels in the bar and customize it.

```
[22]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
      ↪exercise_type)) +
       geom_bar(stat = "identity") +
       #customize titles
       labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
      ↪(kg)") +
          # Customize legend
       guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
      ↪size = 17))+
       # Customize colors
       scale_fill_manual(values = c("lightblue", "lightgreen"))+
       ##add value ion bar
      geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
      ↪"Red")+
        theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
             axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
             ##for axis labels
             axis.title.x = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             axis.title.y = element_text(size = 25, face = "italic", color =␣
      ↪"orange"),
             plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
             ##legend size
             legend.key.size = unit(2.5, "cm"))
```
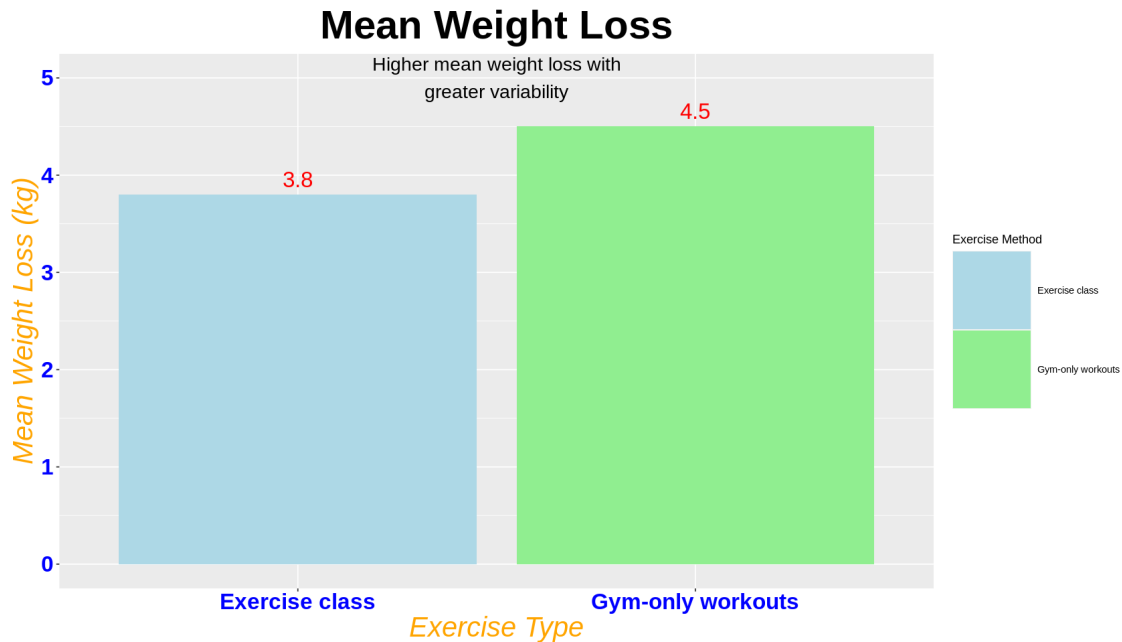
Mean Weight Loss

We can also add text inside graph

```
[35]: ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
       ↪exercise_type)) +
        geom_bar(stat = "identity") +
        #customize titles
        labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
       ↪(kg)") +
          # Customize legend
        guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
       ↪size = 17))+
        # Customize colors
        scale_fill_manual(values = c("lightblue", "lightgreen"))+
        # Add text annotation
        annotate("text", x = 1.5, y = 5, label = "Higher mean weight loss␣
       ↪with\ngreater variability", size = 6) +
        ##add value ion bar
       geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
       ↪"Red")+
         theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
               axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
               ##for axis labels
               axis.title.x = element_text(size = 25, face = "italic", color =␣
       ↪"orange"),
               axis.title.y = element_text(size = 25, face = "italic", color =␣
       ↪"orange"),
```

```
        plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
        ##legend size
        legend.key.size = unit(2.5, "cm"))
```

Mean Weight Loss

Higher mean weight loss with
greater variability

4.5

3.8

Mean Weight Loss (kg)

Exercise Method

Exercise class

Gym-only workouts

Exercise class   Gym-only workouts

Exercise Type

We can also change the background

[43]:
```
ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
↪exercise_type)) +
 geom_bar(stat = "identity") +
 #customize titles
 labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
↪(kg)") +
    # Customize legend
 guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
↪size = 17))+
 # Customize colors
 scale_fill_manual(values = c("lightblue", "lightgreen"))+
 # Add text annotation
 annotate("text", x = 1.5, y = 5, label = "Higher mean weight loss␣
↪with\ngreater variability", size = 6) +
 ##add value ion bar
 geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
↪"Red")+
  theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
        axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
        ##for axis labels
```

12

```
        axis.title.x = element_text(size = 25, face = "italic", color =␣
↪"orange"),
        axis.title.y = element_text(size = 25, face = "italic", color =␣
↪"orange"),
        plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
        ##legend size
        legend.key.size = unit(2.5, "cm"),
        ##background
        panel.background = element_rect(fill = "yellow"),  # Table background
        plot.background = element_rect(fill = "orange"))      # Overall plot␣
↪background)
```


We can also change the theme of this graph.

```
[51]: ##plot1
ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
↪exercise_type)) +
 geom_bar(stat = "identity") +
 #customize titles
 labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
↪(kg)") +
   # Customize legend
 guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
↪size = 17))+
 # Customize colors
 scale_fill_manual(values = c("lightblue", "lightgreen"))+
```

```r
  #changing theme
 theme_bw()+
 # Add text annotation
 annotate("text", x = 1.5, y = 5, label = "Higher mean weight loss␣
↪with\ngreater variability", size = 6) +
 ##add value ion bar
 geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
↪"Red")+
  theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
        axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
        ##for axis labels
        axis.title.x = element_text(size = 25, face = "italic", color =␣
↪"orange"),
        axis.title.y = element_text(size = 25, face = "italic", color =␣
↪"orange"),
        plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
        ##legend size
        legend.key.size = unit(2.5, "cm"))
#plot2

ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
↪exercise_type)) +
 geom_bar(stat = "identity") +
 #customize titles
 labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
↪(kg)") +
   # Customize legend
 guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
↪size = 17))+
 # Customize colors
 scale_fill_manual(values = c("lightblue", "lightgreen"))+
   #changing theme
 theme_dark()+
 # Add text annotation
 annotate("text", x = 1.5, y = 5, label = "Higher mean weight loss␣
↪with\ngreater variability", size = 6, color = "white") +
 ##add value ion bar
 geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
↪"Red")+
  theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
        axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
        ##for axis labels
        axis.title.x = element_text(size = 25, face = "italic", color =␣
↪"orange"),
        axis.title.y = element_text(size = 25, face = "italic", color =␣
↪"orange"),
```
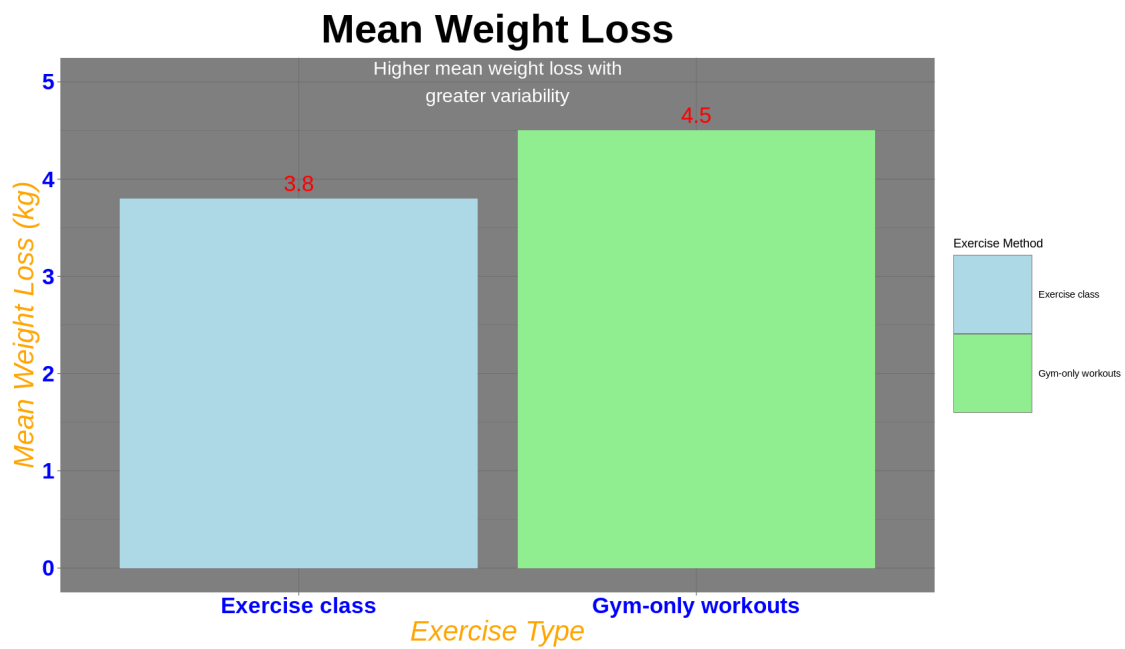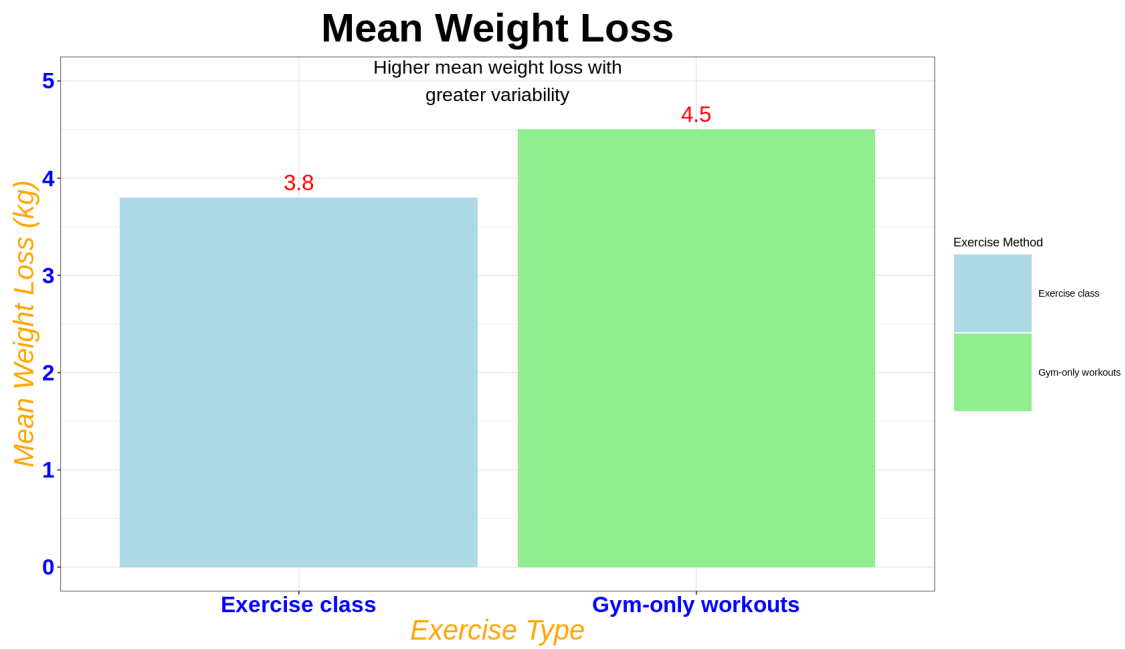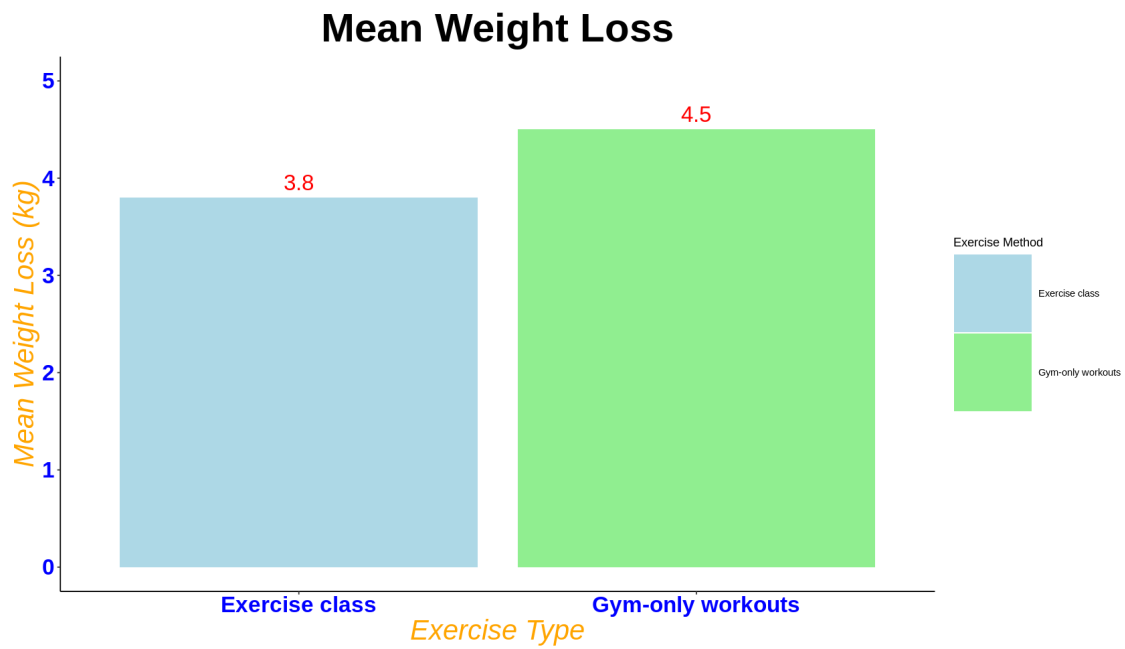
```
        plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
        ##legend size
        legend.key.size = unit(2.5, "cm"))

#plot3

ggplot(data, aes(x = exercise_type, y = mean_weight_loss, fill =␣
 ↪exercise_type)) +
 geom_bar(stat = "identity") +
 #customize titles
 labs(title = "Mean Weight Loss", x = "Exercise Type", y = "Mean Weight Loss␣
 ↪(kg)") +
   # Customize legend
 guides(fill = guide_legend(title = "Exercise Method", title.position = "top",␣
 ↪size = 17))+
 # Customize colors
 scale_fill_manual(values = c("lightblue", "lightgreen"))+
   #changing theme
 theme_classic()+
 # Add text annotation
 annotate("text", x = 1.5, y = 5, label = "Higher mean weight loss␣
 ↪with\ngreater variability", size = 6, color = "white") +
 ##add value ion bar
 geom_text(aes(label = mean_weight_loss), vjust = -0.5, size = 7, color =␣
 ↪"Red")+
  theme(axis.text.x = element_text(size = 20, face ="bold", color = "Blue"),
       axis.text.y = element_text(size = 20, face ="bold",, color = "Blue"),
       ##for axis labels
       axis.title.x = element_text(size = 25, face = "italic", color =␣
 ↪"orange"),
       axis.title.y = element_text(size = 25, face = "italic", color =␣
 ↪"orange"),
       plot.title = element_text(size = 36, hjust = 0.5, face ="bold"),
       ##legend size
       legend.key.size = unit(2.5, "cm"))
```

Mean Weight Loss

Mean Weight Loss

Mean Weight Loss

This is a basic flow of changing bar charts in ggplot. We can explore more.