A/B Testing: Wishlist vs. Basket (= t-test)

## Load the data

## Basic setup ##  
rm(list = ls())  
  
  
  
## Load Data ##  
data <- read.csv("https://raw.githubusercontent.com/Damanpreet7/A-B-Testing/main/OMCA\_AB-Test\_Data.csv", header=TRUE, sep=";")

head(data)

## Calculate Metrics: Open Rate & Click-through-rate

data$OR <- data$Open / data$Sent \* 100  
data$CTR <- data$Click / data$Sent \* 100

## Looking at the data

plot(density(data$OR), main="Density: OR")

plot(density(data$CTR), main="Density: CTR")

## Visually Comparing Open and Click Through Rates

We will be using the “ggplot” package throughout this course. This is a very (if not the most) commonly used and helpful tool for visualization.

# Load the package  
library(ggplot2)  
  
# Plot for OR  
plot\_or <- ggplot(data, aes(x=Group, y=OR)) +  
 stat\_summary(fun=mean, geom="bar") +  
 stat\_summary(aes(label=round(..y..,2)), fun=mean, geom="text", size=4, vjust = -0.5) +  
 labs(title="Open Rate by Campaign",  
 x ="Campaign", y = "Open Rate (in %)") +  
 theme\_light() +  
 coord\_cartesian(ylim = c(0,45))  
plot\_or

# Plot for CTR  
plot\_ctr <- ggplot(data, aes(x=Group, y=CTR)) +  
 stat\_summary(fun=mean, geom="bar") +  
 stat\_summary(aes(label=round(..y..,2)), fun=mean, geom="text", size=4, vjust = -0.5) +  
 labs(title="Click Through Rate by Campaign",  
 x ="Campaign", y = "Click Through Rate (in %)") +  
 theme\_light() +  
 coord\_cartesian(ylim = c(0,45))  
plot\_ctr

# Plotting Results besides each other: Package "ggpubr" might take some time to install  
library(ggpubr)  
ggarrange(plot\_or, plot\_ctr,   
 labels = c("A", "B"),  
 ncol = 2, nrow = 1)

## Advanced: comparing density distributions by group

# Plot Density OR  
plot\_density\_or <- ggplot(data, aes(x=OR, fill=Group))+  
 geom\_density(alpha=0.4) +   
 xlim(20, 60) +  
 labs(fill = "Campaign") +  
 labs(title="Open Rate by Campaign",   
 x="OR (in %)", y = "Density") +  
 theme\_light() +   
 theme(legend.position="bottom")  
  
# Plot Density CTR  
plot\_density\_ctr <- ggplot(data, aes(x=CTR, fill=Group))+  
 geom\_density(alpha=0.4) +   
 xlim(0, 20) +  
 labs(fill = "Campaign") +  
 labs(title="Click Through Rate by Campaign",   
 x="CTR (in %)", y = "Density") +  
 theme\_light() +   
 theme(legend.position="bottom")  
  
# Combine  
ggarrange(plot\_density\_or, plot\_density\_ctr,   
 labels = c("A", "B"),  
 ncol = 2, nrow = 1)

## Warning: Removed 2 rows containing non-finite values (stat\_density).

## Statistically Comparing Open and Click Through Rates

#Open Rate  
t.test(OR ~ Group, data)

# Click-Through-Rate  
t.test(CTR ~ Group, data)

## Alternative: Use Regression instead of a t-test

r1 <- lm(OR ~ Group, data)  
summary(r1)

r2 <- lm(CTR ~ Group, data)  
summary(r2)