Final Project

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Introduction

Exploratory Analysis

```
Rows: 143
Columns: 2
$ initial_total_pr <dbl> 4.99, 4.98, 4.49, 0.99, 0.01, 4.99, 0.01, 3.99, 4.99,~
$ dealing_pr       <dbl> 51.55, 37.04, 45.50, 44.00, 71.00, 45.00, 37.02, 53.9~
```

Result

To investigate whether the average initial total price (the sum of starting price and shipping price) equals to the average dealing price, we need to conduct a two sample mean T test.

Hypotheses

Before starting hypothesis testing, we need to bring out null hypothesis and alternative hypothesis of our research question. Our null hypothesis for the hypothesis testing is that there is no difference between the mean initial total price and the mean dealing price. Our alternative hypothesis is that there is a difference between the mean initial total price and the mean dealing price of Mario Kart. In symbols:

$$H_0 : \mu_{diff} = 0$$

$$H_A : \mu_{diff} \neq 0$$

To investigate whether our null hypothesis is true, we need to conduct a **Two Sample T Test**. Before conducting the hypothesis testing, we need to check the conditions: **independence** and **normality condition**.

Checking Conditions

Since the `mariokart` dataset is collected, it is a simple random sample, and we can assume that each pair of the initial total price and the dealing price are independent. While there are some outliers, $n = 143$ and none of the outliers are particularly extreme, so the normality condition is satisfied. With these conditions satisfied, we can move forward with the t-distribution.

Calculating T Statistics

Using two means t test, we will compute the T-score, which means the ratio of how the sample mean difference varies from zero as compared to how the observations vary. We compute T statistics using the formula below:

$$T = \frac{\bar{x}_{paired}}{\sqrt{\frac{S^2_{paired}}{n}}}$$

```
# Calculate the mean difference of initial price and the dealing price of Mario Kart
x_bar_paired = mean(price_Difference)
```

```
# Calculate S_paired
```

Discussion