FA7

Paul Joaquin M. Delos Santos

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```
# Create the dataset
data <- data.frame(
  Participant = 1:24,
  Cloak = c(rep(0, 12), rep(1, 12)),
  Mischief = c(3, 1, 5, 4, 6, 4, 6, 2, 0, 5, 4, 5,
               4, 3, 6, 6, 8, 5, 5, 4, 2, 5, 7, 5)
)
```

Assumptions Checks

Assumption 1: Continuous Dependent Variable The dependent variable (Mischief) is continuous.

Assumption 2: Independent Groups

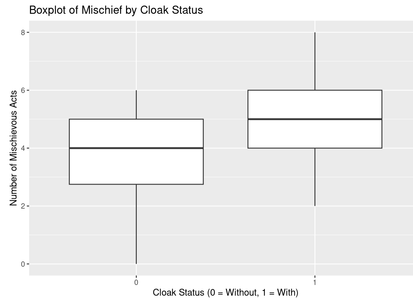
The independent variable (Cloak) consists of two categorical, independent groups.

Assumption 3: Independence of Observations

Each participant belongs to only one group.

Assumption 4: Outliers

```
# Boxplot to inspect outliers
ggplot(data, aes(x = factor(Cloak), y = Mischief)) +
  geom_boxplot() +
  labs(title = "Boxplot of Mischief by Cloak Status",
       x = "Cloak Status (0 = Without, 1 = With)",
       y = "Number of Mischievous Acts")
```



Assumption 5: Normality

```
# Shapiro-Wilk test for normality
shapiro_test_without_cloak <- shapiro.test(data$Mischief[data$Cloak == 0])
shapiro_test_with_cloak <- shapiro.test(data$Mischief[data$Cloak == 1])

shapiro_test_without_cloak
```

```
##
##  Shapiro-Wilk normality test
##
## data:  data$Mischief[data$Cloak == 0]
## W = 0.91276, p-value = 0.2314
```

```
shapiro_test_with_cloak
```

```
##
##  Shapiro-Wilk normality test
##
## data:  data$Mischief[data$Cloak == 1]
## W = 0.97262, p-value = 0.9362
```

Assumption 6: Homogeneity of Variances

```
# Levene's Test for homogeneity of variances
levene_test_result <- leveneTest(Mischief ~ factor(Cloak), data = data)
levene_test_result
```

```
## Levene's Test for Homogeneity of Variance (center = median)
##       Df F value Pr(>F)
## group  1  0.2698 0.6087
##       22
```

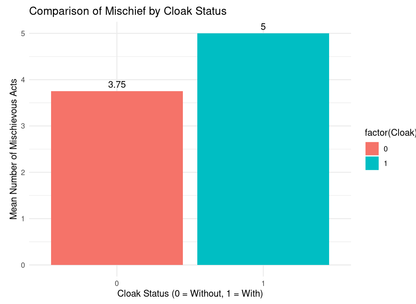
Comparison of two means

```
# Comparison of Two Means
# Calculate group means
library(dplyr) # Ensure dplyr is loaded
group_means <- data %>%
  group_by(Cloak) %>%
  summarise(Mean_Mischief = mean(Mischief), .groups = 'drop')

# Print group means
print(group_means)
```

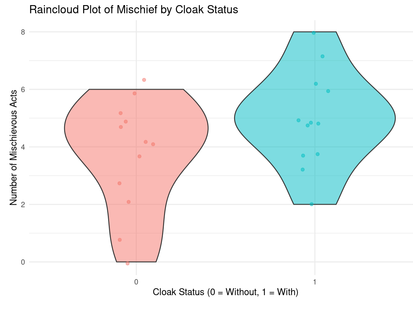
```
## # A tibble: 2 × 2
##   Cloak Mean_Mischief
##   <dbl>         <dbl>
## 1     0          3.75
## 2     1          5
```

```
# Simple bar plot to visualize means
ggplot(group_means, aes(x = factor(Cloak), y = Mean_Mischief, fill = factor(Cloak))) +
  geom_bar(stat = "identity", position = "dodge") +
  geom_text(aes(label = round(Mean_Mischief, 2)), vjust = -0.5) +
  labs(title = "Comparison of Mischief by Cloak Status",
       x = "Cloak Status (0 = Without, 1 = With)",
       y = "Mean Number of Mischievous Acts") +
  theme_minimal()
```



rain cloud plot "# Raincloud plot to visualize means

```
ggplot(data, aes(x = factor(Cloak), y = Mischief, fill = factor(Cloak))) +
  geom_violin(trim = TRUE, alpha = 0.5) +
  geom_jitter(aes(color = factor(Cloak)), width = 0.1, alpha = 0.5) +
  labs(title = "Raincloud Plot of Mischief by Cloak Status",
       x = "Cloak Status (0 = Without, 1 = With)",
       y = "Number of Mischievous Acts") +
  theme_minimal() +
  theme(legend.position = "none")
```



Independent Samples T-Test

```
# Conducting the independent samples t-test
t_test_result <- t.test(Mischief ~ Cloak, data = data)
t_test_result
```

```
##
##  Welch Two Sample t-test
##
## data:  Mischief by Cloak
## t = -1.7135, df = 21.541, p-value = 0.101
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
## 95 percent confidence interval:
##  -2.764798  0.264798
## sample estimates:
## mean in group 0 mean in group 1
##            3.75            5.00
```