In [1]:
```
import pandas as pd

# Load the dataset
df = pd.read_csv('/Users/maazhussain/Desktop/Projects/AB Testing & Experimer

# Check basic conversion stats
conversion_rates = df.groupby('group')['converted'].agg(['mean', 'count', 's
conversion_rates
```

Out[1]:

group	conversion_rate	count	sum
control	0.126531	490	62
treatment	0.182353	510	93

In [3]:
```
from statsmodels.stats.proportion import proportions_ztest

# Successes and observations
success = [62, 93]              # Converted
n_obs = [490, 510]              # Total users

# One-tailed test (treatment > control)
z_stat, p_val = proportions_ztest(success, n_obs, alternative='larger')

print(f"Z-statistic: {z_stat:.4f}")
print(f"P-value: {p_val:.4f}")
```

```
Z-statistic: -2.4384
P-value: 0.9926
```

📊 A/B Testing – Conversion Experiment Report

🧭 Objective

To evaluate whether a new treatment (e.g., updated design, messaging, or offer) leads to a higher user conversion rate compared to the existing control group.

📁 Dataset Summary

Total Users: 1000 (490 control, 510 treatment) Features: user_id: Unique identifier group: A/B group assignment (control, treatment) converted: Conversion outcome (1 = converted, 0 = not)

🔬 Hypotheses

Null Hypothesis (H_0): The conversion rate of the treatment group is equal to or less than the control group. Alternative Hypothesis (H_1): The treatment group has a higher conversion rate.

📈 Observed Conversion Rates

Group Conversion Rate Users Conversions Control 12.65% 490 62 Treatment 18.24% 510 93

🧪 Test Performed

Test Type: Two-sample proportions z-test (one-tailed) Z-statistic: -2.4384 P-value: 0.9926

✅ Conclusion

The p-value (0.9926) is much greater than the 0.05 threshold. Therefore, we fail to reject the null hypothesis. ➡️ There is no statistically significant evidence that the treatment group performs better than the control group. The observed uplift is likely due to chance.

In [ ]: