main.r

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```r
# Variant data from Excel
conv_A <- 50
n_A <- 500

conv_B <- 76
n_B <- 499

# Conversion rates
p_A <- conv_A / n_A
p_B <- conv_B / n_B

p_A
p_B

prop_test <- prop.test(
  x = c(conv_B, conv_A),
  n = c(n_B, n_A),
  correct = FALSE,      # IMPORTANT: matches Excel Z-test
  conf.level = 0.95
)

prop_test

# pooled proportion
```

Output | Clear

```
[1] 0.1
[1] 0.1523046

    2-sample test for equality of proportions without continuity correction

data:  c(conv_B, conv_A) out of c(n_B, n_A)
X-squared = 6.1991, df = 1, p-value = 0.01278
alternative hypothesis: two.sided
95 percent confidence interval:
 0.01125128 0.09335794
sample estimates:
   prop 1    prop 2
0.1523046 0.1000000

[1] 0.01112991 0.09347931

=== Code Execution Successful ===
```

```r

# pooled proportion
p_pool <- (conv_A + conv_B) / (n_A + n_B)

# standard error
SE <- sqrt(p_pool * (1 - p_pool) * (1/n_A + 1/n_B))

# difference
diff <- p_B - p_A

# confidence interval
lower <- diff - 1.96 * SE
upper <- diff + 1.96 * SE

c(lower, upper)

```