

HW06_11.1_RCode

```
X1 <- c(1.1650, 0.6268, 0.0751, 0.3516)
X2 <- c(0.3035, 2.6961, 1.0591, 2.7971, 1.2641)

mean_X1 <- mean(X1)
mean_X2 <- mean(X2)

meanX1X2 <- mean_X1 - mean_X2

n1 <- length(X1)
n2 <- length(X2)

# Given variance
sigma_squared <- 1

# Standard error of the difference of means for Z-test
se <- sqrt(sigma_squared / n1 + sigma_squared / n2)

# Z statistic
z_stat <- meanX1X2 / se

# Two-sided p-value for the Z-test
p_value <- 2 * pnorm(abs(z_stat), lower.tail = FALSE)

# Pooled variance for part b
var_X1 <- var(X1)
var_X2 <- var(X2)
pooled_variance <- (((n1 - 1) * var_X1) + ((n2 - 1) * var_X2)) / (n1 + n2 - 2)

# Results
cat("Mean of first set: ", mean_X1, "\n")
```

Mean of first set: 0.554625

```
cat("Mean of second set: ", mean_X2, "\n")
```

Mean of second set: 1.62398

```
cat("Difference of means: ", meanX1X2, "\n")
```

Difference of means: -1.069355

```
cat("Pooled variance: ", pooled_variance, "\n")
```

Pooled variance: 0.7666932

```
cat("Standard error of the difference of means: ", se, "\n")
```

Standard error of the difference of means: 0.6708204

```
cat("Z-statistic: ", z_stat, "\n")
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Z-statistic: -1.5941

```
cat("p-value: ", p_value, "\n")
```

p-value: 0.1109136