**Hypothesis Testing**

Given information - **Population Mean(µ) = 1000m^3**

**Sample Size(n) = 100**

**Sample Mean() = 1005m^3**

**Sample Variance(s^2) = 400m^6**

**s = 20m^3**

1. From the given test I can infer that the null hypothesis has failed to reject when the daily water intake mean is less than or equal to 1000m^3 the null hypothesis is rejected when the daily water intake mean is greater than 1000m^3.
   1. Null Hypothesis failed to reject Ho - **µ <= 1000m^3**
   2. Null Hypothesis rejected H1 - **µ > 1000m^3**
2. Perform the test at the significance level (α) = 0.05
   1. Here, they have given sample variance so, we have to consider t-table

**µ = ± z \* (α / 2) \* s/√n**

**1000 = 1005 + z \* 20/√100**

**2 \* z = 1005 - 1000**

**z = 5 / 2**

**z = 2.5**

Significance level is 0.05, so the confidence level would be 1 - 0.05

Confidence level = 0.95

Critical Value(Half Tailed) = 1.96

Test Statistic = 2.5

**Test Statistic > Critical Value so, we reject the null hypothesis**

1. The smallest value would be P(Z > 1.65) = 1 - P(Z <= 1.65)

= 1 - 0.9505

= 0.0495

1. It is in the range of Z > 1.65

( - µ) /(Sample σ/**√**n) > 1.65

> 1003.3

Power of the test will be = 1003.3 - µ / 2

When µ0 = 1008

1003.3 - 1008/2 = -2.35

P(Z > -2.35) = 1 - P(Z > 2.35)

= 1 - (1 - 0.9906) = 0.9906

1. Following statements true/false:
   1. If we reject the null hypothesis at **α = 0.05** then we will reject **α = 0.1 (TRUE)**
   2. The type 1 error will occur when we reject the null hypothesis when it should not rejected. **(FALSE)**
   3. p-value = 0.15 and **α =** 0.1 here p > α then we will fail to reject the null hypothesis **(FALSE)**