1. Randomly selecting samples from the population.

2. Confounding variables are those unmeasured variables but can affect the result of the experiment.

3. A/B testing can be used in comparing two versions of some stuffs and see which version has better performance.

4. It is an unequal variances t-test that is used to determine whether the mean of two populations are equal or not.

5. $H_0 : \mu = 6.5$

$H_1 : \mu < 6.5$

$$p\text{-value} = P\left(t < \frac{6 - 6.5}{1.2/\sqrt{50}}\right) \qquad df = 49$$

$$= P(t < -2.94)$$

$$\approx 0.0016 < 0.05 = \alpha$$

Conclusion: we reject "$H_0 : \mu = 6.5$" with 0.05 level of significance.

6. $H_0 : \mu_A = \mu_B$

$H_1 : \mu_A \neq \mu_B$

$$p\text{-value} = 2 \cdot P\left(z < \frac{75 - 78}{\sqrt{\frac{8^2}{25} + \frac{7^2}{30}}}\right)$$

$$= 2 \cdot P(z < -1.47)$$

$$= 0.1416 > 0.05 = \alpha$$

Conclusion: we failed to reject H_0 with 0.05 level of significance.