# Two-Sample Tests

1. Are each of these samples from independent or related populations?

    - To estimate the impact of a training program, you obtain the income before and after taking the training from 100 individuals. - (Independent / Related)

    - To test whether internet usage is different between age groups, you take a sample of 50 youth and 50 middle aged individuals. - (Independent / Related)

    - To compare the prices in a bookshop and online book store you take a sample of 10 books and check the price of each book in the bookshop as well as online. - (Independent / Related)

    - To compare the prices in a bookshop and online book store you take a sample of 10 books from the bookshop and another sample of 10 books from the online store. - (Independent / Related)

2. Which of the following statements is true?

    - The interpretation of the p-value from a test comparing two means is: if the p-value is smaller than the chosen significance level, then reject the null of equal means.

    - To test the hypothesis that girls obtain better marks for Economics than boys on average, we write:

    $$H_0 : \mu_{girls} = \mu_{boys} \quad , \quad H_1 : \mu_{girls} \neq \mu_{boys}$$

    - Whether you carry out the pooled variance t-test or the unequal variances t-test, the result will be the same, only the standard error will be different.

- When comparing the means of two populations, only the critical value approach can be used.

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3. We carry out the F-test for equal variances and find that $\hat{F} > F_{a/2}$. In that case, we should use the unequal variances t-test.

(True/False)

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4. We always prefer a paired t-test to an independent populations t-test because:

- The independent populations test assumes that the populations are normally distributed whereas the paired t-test doesn't.
- The paired t-test is easier to carry out.
- The paired t-test has a smaller standard error than the independent population t-test.
- We can control for outside factors that might be driving differences between the groups.

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