HYPOTHESIS TESTING

KEY WORDS & DEFINITIONS

1 Hypothesis Test
A process that considers the probability of an observed (or calculated) value occurring.

2 Null Hypothesis, H_0
The hypothesis about the parameter that is assumed to be correct.

3 Alternative Hypothesis, H_1
The hypothesis about the parameter if the assumption is not correct.

4 Test Statistic
The result of an experiment, or the value calculated from a sample.

5 One-tailed Test
A hypothesis test that involves the alternative hypothesis describing the parameter as being less than or greater than the null hypothesis value.

6 Two-tailed test
A hypothesis test that involves the alternative hypothesis describing the parameter as taking any value that is not the null hypothesis value.

7 Critical Region
The region of the probability distribution where the test statistic value would result in the null hypothesis being rejected.

8 Critical value
The first value of the test statistic that could fall in the critical region.

9 Significance Level
The total probability of incorrectly rejecting the null hypothesis.

WHAT DO I NEED TO KNOW

To carry out a Hypothesis Test, assume H_0 is true, then consider how likely the observed value of the test statistic was to occur. Remember we need it to be **even more unlikely** than the significance level in order to be 'significant' and to reject H_0.

If the test is two-tailed there are two critical regions, one at each end of the distribution. We therefore need to halve the significance level at the end we are testing.

If the test statistic is $X \sim B(n, p)$ then the **expected** outcome is **np**

If the observed value lies in critical region we say there is sufficient evidence to reject H_0 and conclude that H_1 is correct.

If observed value is not in critical region we say there is insufficient evidence to reject H_0.

ALWAYS add a final line in your conclusion in the **context** of the question

Beware of questions that say 'The probability in the tail should be as close as possible to the significance level'. In these cases we may choose a value that is actually *slightly* more likely than the significance level.

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