DATA SCIENCE WITH R

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HYPOTHESIS TESTING

Introduction to Hypothesis Testing

Basic Framework of a Hypothesis Test

Distance Measures

Central Limit Theorem

Types of Hypothesis Tests

Population Std Deviation Not Known

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Example: IQ Testing

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2. The distribution of sample means will follow **T (μ, s/(**$\sqrt{n}$)

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Conclusion – Reject Null Hypothesis

Directional Tests

One Tailed v/s Two Tailed Tests

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Which is appropriate?

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- You are not interested in testing if **packaged weight is greater**
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A manufacturing process has to generate auto parts with weights of exactly 0.8 lbs. If you were running a quality check, you will want to check if the process is producing units of exactly 0.8 lbs or different from 0.8 lbs.

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- This would therefore be a two tail test

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Another example:

You are testing efficacy of a drug, and you cannot be sure if it is better or worse than the existing protocol

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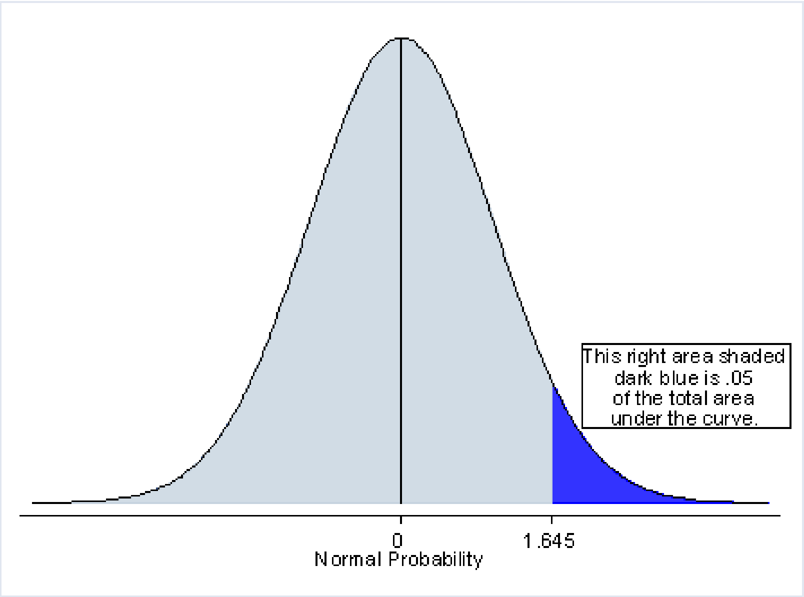
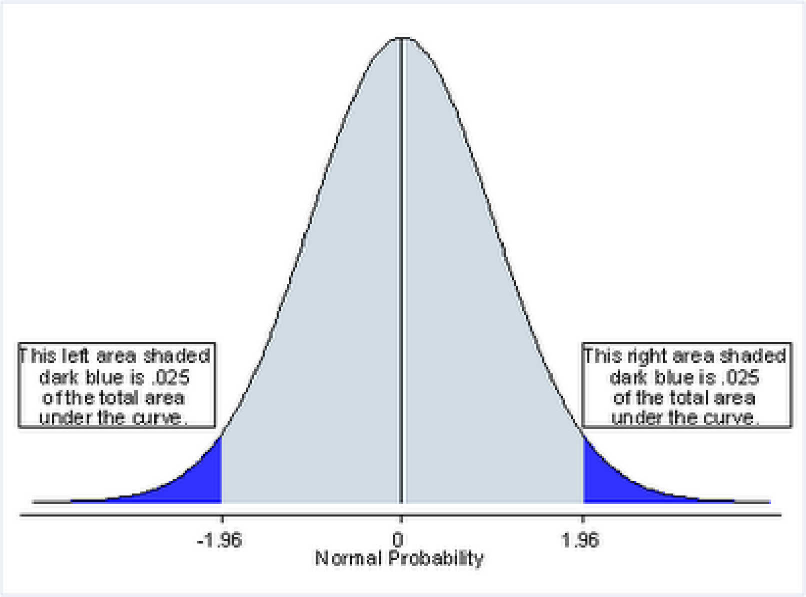
What are the implications of one tail v/s two tail?

One Tailed v/s Two Tailed Tests

- If you are testing X > µ or X < µ, rejection region will fall on one side of the distribution curve

- If you are testing X < > µ, then rejection region will fall symmetrically on both sides of the curve





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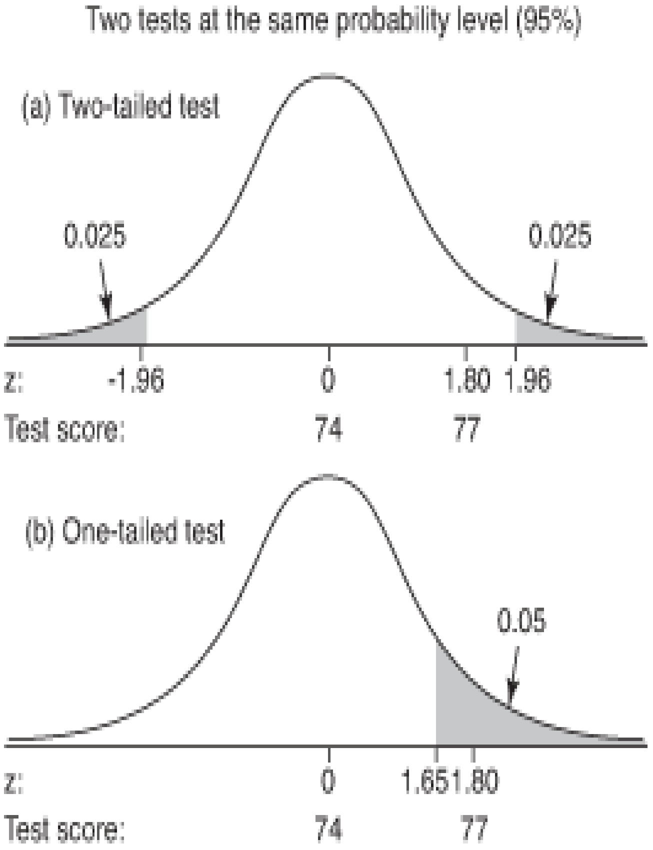
In terms of practical application to hypothesis tests,

If using a two tail test, the rejection criteria for a 5% level of significance:



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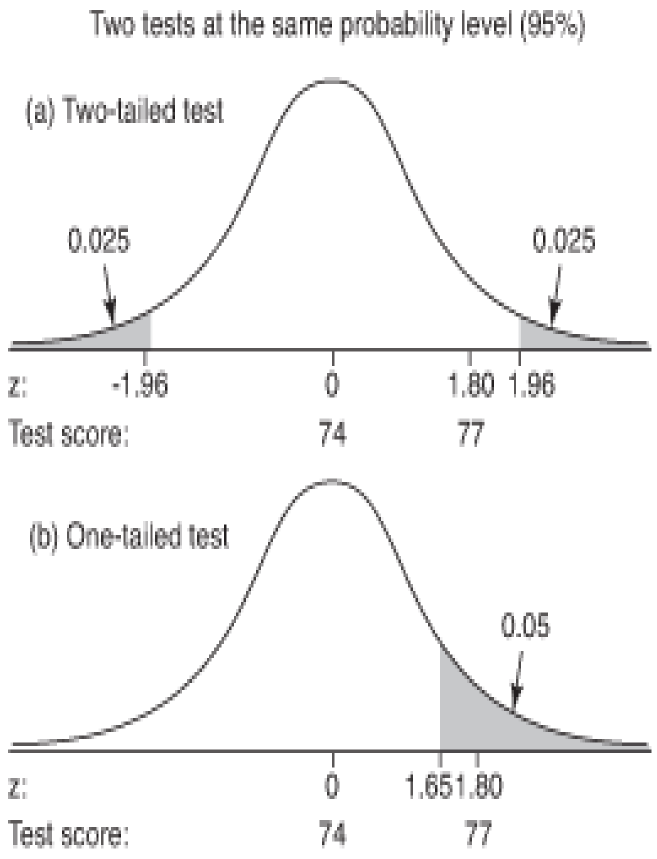

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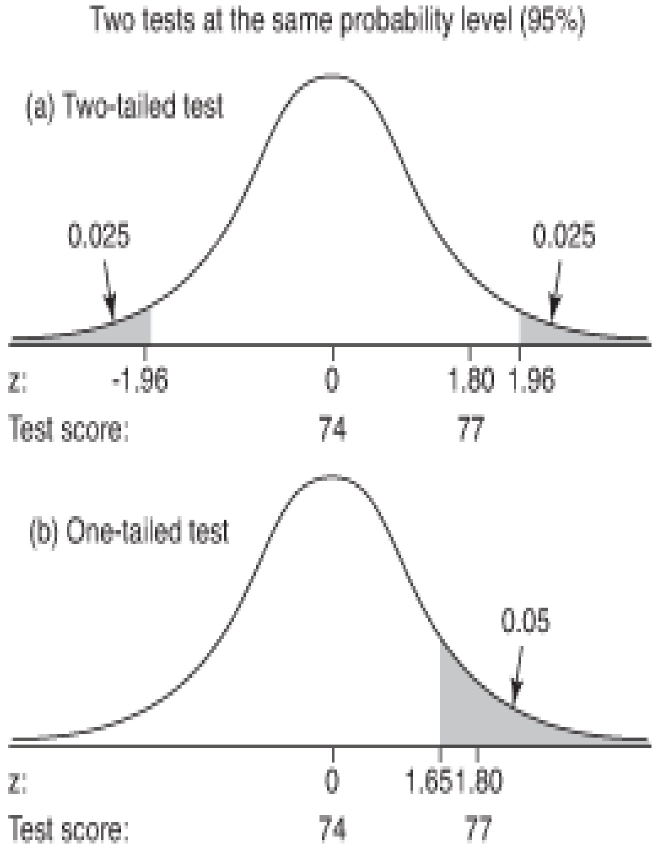
Which is a stricter test, one-tail or two-tail?



Coming Up

<u>Types of Hypothesis Tests:</u>

Two Sample Tests

THANK YOU