



# *Data Science*

*Cross Validation*

*October 8th, 2014*

# The First Premise of Statistics

# *Blind Experiments*

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**sample mean =  $\text{sum}(x)/n$**

**Two treatment groups**

**treatment effect = (mean 1) - (mean 2)**

**Under the assumption of Normality**

**treatment effect  $\sim t_{\text{distribution}}$**

# *Cross Valication Reproduces Blind Experiment*

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- *Divide sample and for each model predict y values*
- *Decide on an evaluation metric - is the average response the right metric?*
- *Compare model treatments across groups*



# Cross Validation Has No Benchmark

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- *In our first blind experiment we began with a modelled distribution*
- *Under normality two sample means are distributed asymptotically as a  $t$  distribution*
- *An expected distribution allows a researcher to form and test hypotheses*