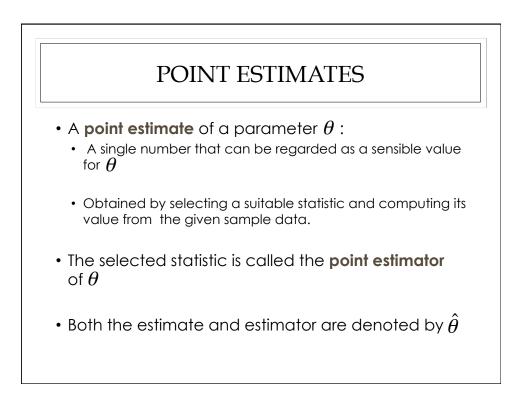
BASIC PRINCIPLES OF POINT ESTIMATION MATH 3342 SECTION 6.1



HOUSING PRICE EXAMPLE

All Values Given in Thousands of Dollars

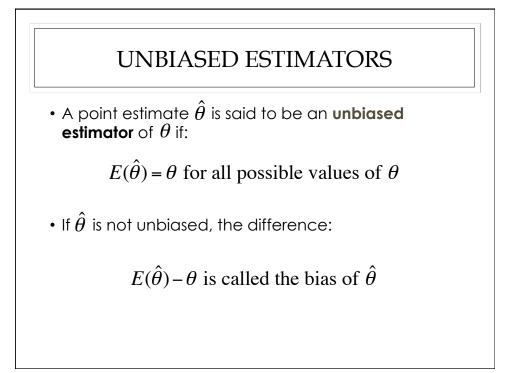
{House Prices} = {144; 98; 204; 177; 155; 316; 100}

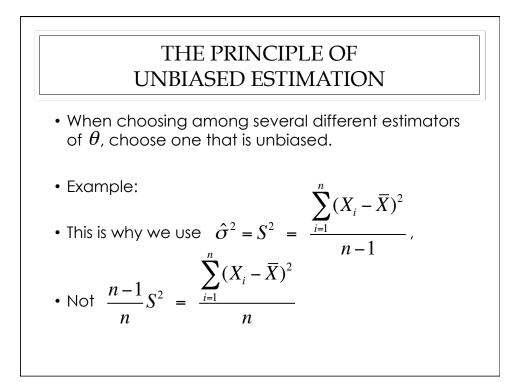
$$\overline{x} = 170.6$$
$$\widetilde{x} = 155$$

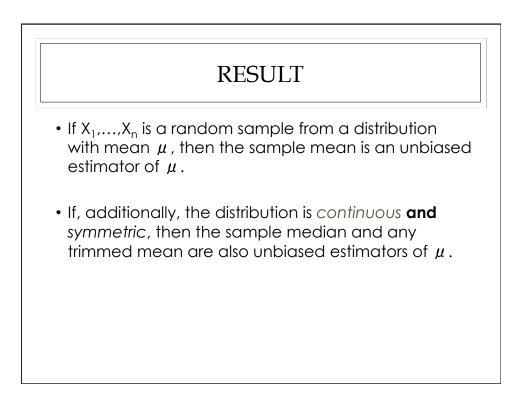
$$\overline{x}_{14.3\%} = 156$$

All of these are point estimates of μ !!!

How do we know which one to use?







ESTIMATORS WITH MINIMUM VARIANCE

- Among all estimators of θ that are unbiased, choose the one that has minimum variance.
- The resulting $\hat{\theta}$ is called the **minimum variance unbiased estimator (MVUE)** of θ
- See pages 246 248 for an example.

THEOREM

- Let X_1, \ldots, X_n be a random sample from a normal distribution with mean μ and standard deviation σ .
- Then:

 $\hat{\mu} = \overline{X}$ is the MVUE for μ

STANDARD ERROR

• The **standard error** (SE) for an estimator is its standard deviation.

$$\sigma_{\hat{\theta}} = \sqrt{V(\hat{\theta})}$$

- The usual measure of precision for an estimator.
- Often, SE depends on unknown parameters, so we must use **estimated standard error** instead.
 - Denoted by $\hat{\sigma}_{\hat{\theta}}$ or $s_{\hat{\theta}}$

