STA 13A
Fifth Week Discussion

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Review on materials covered

Some Important terminology last week

- random variable (discrete & continuous)
- probability distribution of a discrete random variable (what are the requirements ?)
- mean, or **expected value**

$$\mu = E(X) = \sum xp(x)$$

- variance, standard deviation

$$\begin{aligned}\sigma^2 &= E[(X - E(X))^2] \\ &= E(X^2) - [E(X)]^2\end{aligned}$$

- Binomial Random Variable

$$p(x) = \binom{n}{x} p^x q^{n-x}$$

- Mean: $\mu = np$, Variance: $\sigma^2 = npq$
- probability distribution of a continuous random variable
- density function $f(x)$
- pdf for normal random variable $X \sim \mathcal{N}(\mu, \sigma^2)$

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

- standard normal distribution $X \sim \mathcal{N}(0, 1)$
- z-value: $z = \frac{x-\mu}{\sigma}$ Used to calculate $P(X < c)$

Some Typical Questions

- Refer to Textbook 4.4, 4.22, 4.54, 4.84
- Questions on homework if you have any!!! If not, that is the end of class :)