L33: Apr. 24, 2017

Housekeeping:
- Final Essay May 5: Canvas 11:59 p.m.
- "Final" exam (exam 3): May 5 { 10:30 a.m. – Sn. 01 / 1:00 p.m. – Sn. 02 } in this room
- Infographics
- Poisson distribution
- Homework due weds.
- Quiz weds.

Last time: Mean, s.d. of binomially distributed r.v.:

If a Bernoulli trial is conducted n times, with prob. p of success at each trial:

$$\boxed{\begin{aligned} \mu &= n \cdot p \\ \sigma^2 &= n \cdot p \cdot (1-p), \text{ so } \sigma = \sqrt{n \cdot p \cdot (1-p)} \end{aligned}}$$

L33, ct'd.

Ex. 45% of donors in Greater NY Blood Program have Type-O blood.

A gp. of 5 donors is randomly selected.

These trials constitute Bernoulli trials, so if we let

$X :=$ the # of donors (of the 5 selected) with Type-O blood,

then we know X is binomially distributed.

$$X \sim \text{binom}(5, 0.45)$$

Compute the expected value:

$$E[X] = n \cdot p = 5(0.45) = 2.25$$

Compute the s.d:

$$\sigma^2[X] = n \cdot p \cdot (1-p) = 5(0.45)(0.55)$$

$$= 2.25(0.55)$$

$$= 1.2375$$

variance

s.d.

$$\sigma = \sqrt{1.2375} \approx 1.112$$

More on independence & fixed probability for repeated sampling ...

(b) Of 26 students, a gp. of 10 students is asked whether they own a TI-84 calculator (y/n).

Let's say $\frac{8}{26}$ have a TI-84.

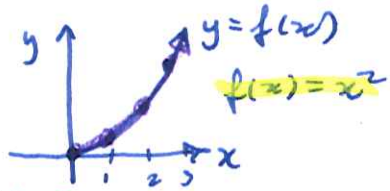
$P(1^{st} \text{ has a TI-84}) = \frac{8}{26}$

$\underbrace{P(2^{nd} \text{ —"— }) = \frac{7}{25}}_{\text{if } 1^{st} \text{ had a TI-84}}$; $\underbrace{P(2^{nd} \text{ has a 84}) = \frac{8}{25}}_{\text{if } 1^{st} \text{ didn't have one.}}$

Continuous random variables.

Recall: Cts. data can take on any value from an interval of the real number line — as such, probability distributions cannot be given in tables. Must have closed formulas or graphs.

(just like



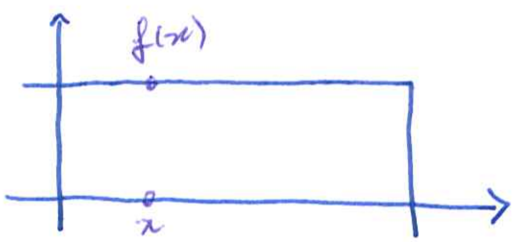
cts. version

x	$f(x)$
0	0
1	1
2	4

)

discrete

Example: One type of cts. r.v. is the UNIFORMLY DISTRIBUTED r.v. — its graph is shaped like a rectangle.



The values of a uniform r.v. are spread evenly over the whole range of possibilities.