Crafting with Data

Reality, Illusions, Truth & the Future

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Plan for Today

- Present New York Data project results
- Confirmatory Statistics
- Quincunx plans
- Readings & Assignments

New York Data: Results

- question you had
- analysis attempted
- Answers learned

Binomial Distribution

Binomial Distribution

- The probability that a random variable X with binomial distribution B(n,p) is equal to the value k, where k = 0, 1,....,n. p is the probability of success

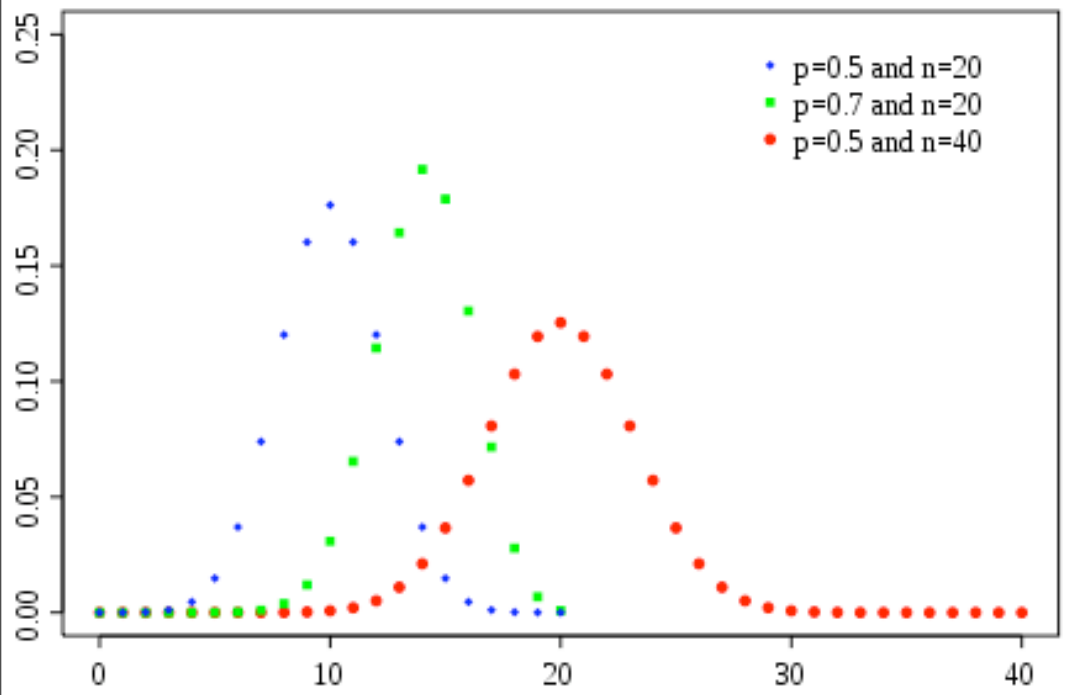
$$P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}$$

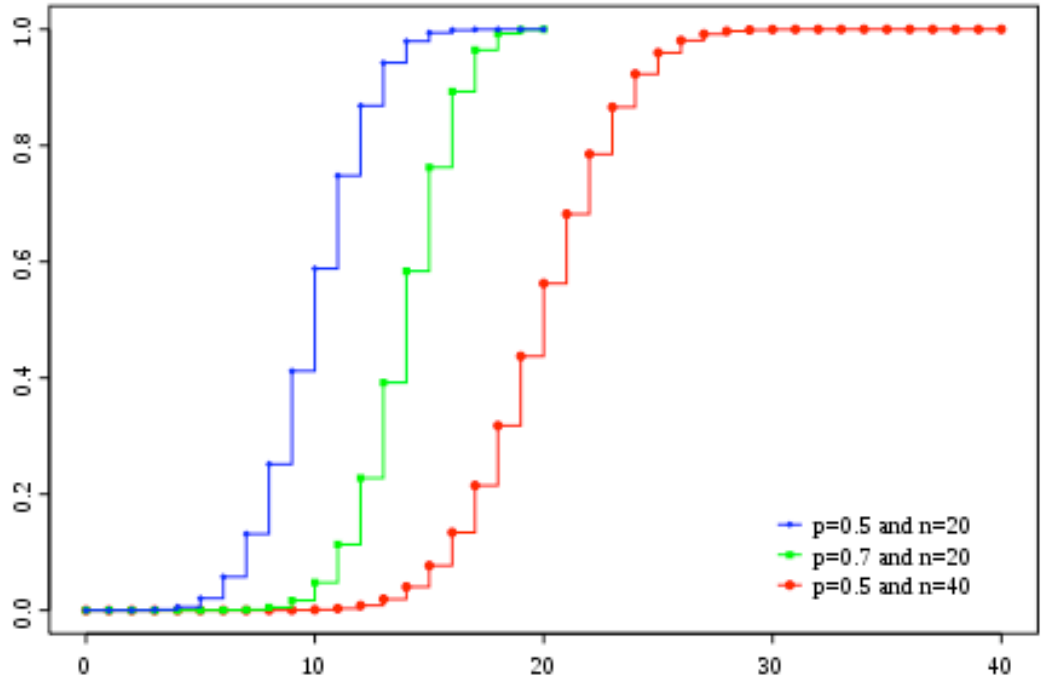
- *n choose k (number of ways to choose k successes from n variations, like five heads in ten coin tosses)*

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

Binomial Distribution

- Mass and Cumulative





http://www.stat.tamu.edu/~west/applets/binomialdemo.html

Chi-square

Chi-square

- Where *O* is the observed frequency and *E* is the expected frequency

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

- look up result in a table, degrees of freedom are *k*-1

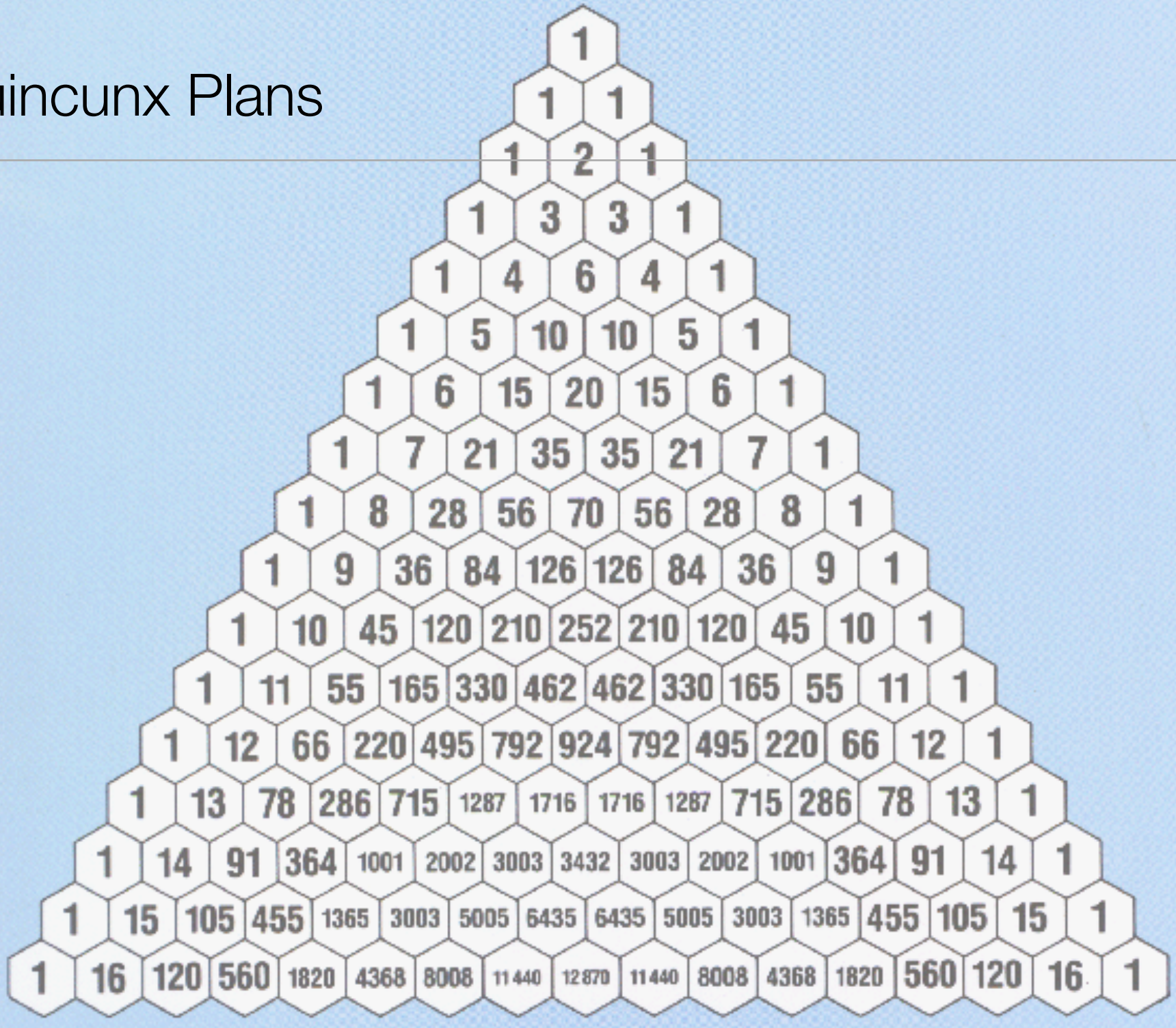
- breaks down if expected frequencies are too low

Exercise One: Spinning Coins

- Results

- Chi-square

Quincunx Plans



Readings and Assignments

- Readings

- Assignments

  - Build either a real quincunx OR make a program to simulate a quincunx (or if you're feeling inspired, build any device or program that incorporates the probability density distribution (normal curve) in its fundamental operation)