Discrete Response Model
Lecture 1

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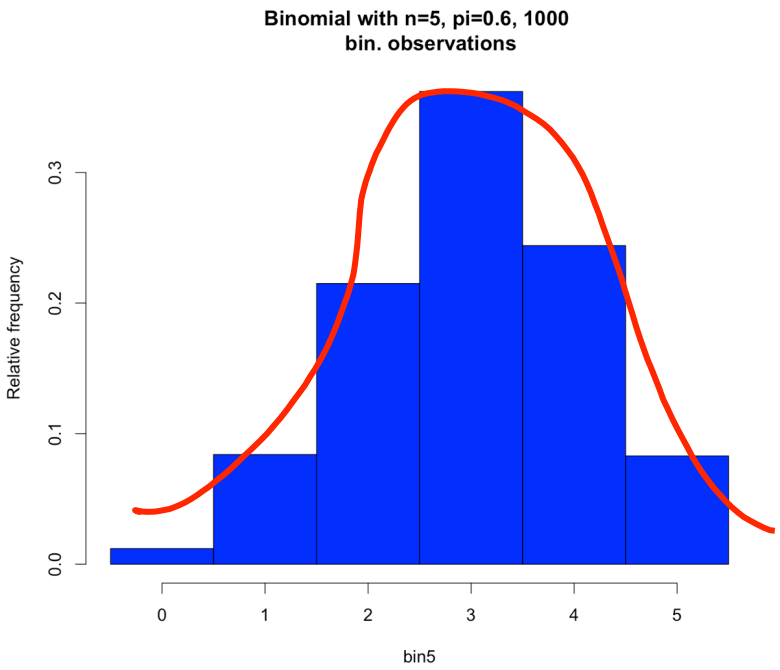
Simulating a Binomial Probability Model

Simulation: Binomial Probability Model:

- The purpose of this example is to show how one can "simulate" observing a random sample of observations from a population characterized by a binomial distribution.
- Why would someone want to do this?
  - It is easier to visualize an abstract, mathematical probability model.
  - It allows to examine the change of characteristics of the distribution as the defining parameters (i.e., pi and n, in the case of the binomial probability model) change.
- All the standard/common probability models are available in R.
- ➔ Talk about distribution, probability, and so on, in R here.

Simulation: Binomial Probability Model

```
> set.seed(4848)
> bin5<-rbinom(n = 1000, size = 5, prob = 0.6)
> bin5[1:20]
 [1] 3 2 4 1 3 1 3 3 3 4 3 3 3 2 3 1 2 2 5 2
> mean(bin5)
[1] 2.991
> var(bin5)
[1] 1.236155
> table(x = bin5)
x
  0   1   2   3   4   5
 12  84 215 362 244  83
```




```
hist(x = bin5, main = "Binomial with n=5, pi=0.6, 1000
    bin. observations", col="blue", probability = TRUE, breaks = -
    0.5:5.5, ylab = "Relative frequency")
```

- The shape of the histogram looks similar to the shape of the actual binomial distribution.
- The mean and variance are close to what we expect them to be!

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