

Lecture 1_1 Code

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Simulating a discrete random variable: the r-function

Simulate tossing a coin ten times, with probability (which I call θ below) of heads 0.5:

```
extraDistr::rbern(n = 10,prob = 0.5)
```

```
## [1] 1 1 0 1 1 0 1 0 1 1
```

The probability mass function: Bernoulli

$$p_X(x) = \theta^x(1 - \theta)^{(1 - x)}$$

where $x=0$ or $x=1$.

What's the probability of a tails/heads? The d-function

```
extraDistr::dbern(0,prob=0.5)
```

```
## [1] 0.5
```

```
extraDistr::dbern(1,prob=0.5)
```

```
## [1] 0.5
```

Notice that these probabilities sum to 1.

The cumulative probability distribution function: the p-function:

$$F(x = 1) = Prob(X \leq 1) = \sum_0^1 p_X x = 1$$

```
extraDistr::pbern(1,prob=0.5)
```

```
## [1] 1
```

$$F(x = 0) = Prob(X \leq 0) = \sum_0^1 p_X x = 0.5$$

```
extraDistr::pbern(0,prob=0.5)
```

```
## [1] 0.5
```