

Download codes for this lecture at:

IntroToR: <https://www.dropbox.com/s/1n6axh4oou7h8ra/IntroToR.R?dl=0>

Lecture 1 codes: <https://www.dropbox.com/s/fn6xiqtuzuypmge/Lec1.R?dl=0>

Getting familiar with R

We will first go over the IntroToR.R file that is available on <https://swms2021.wordpress.com/> for Day 2.

Please upload this IntroToR.R file on your Rstudio Cloud project following my directions. This will allow you to run the code in this file, line-by-line.

If you are on the phone, and not on the laptop, then don't worry. All computing will mostly happen in groups with screen-sharing on.

Probability and Randomness

Consider the following questions:

- What is the probability of seeing a heads for a fair coin?
- What is the probability of seeing a tails for Sholay's Jai's coin?
- What is the probability of seeing a roll of a dice come up "3"?
- Fahadh Faasil¹ has three kind of shirts in his wardrobe. Pink, Green, Red. If he randomly chooses one shirt from his wardrobe, what is the probability it is pink?

How are we calculating the probabilities above?

- We are defining an experiment.
- Fixing an *event*, A , that we are interested in and figuring out in how many ways is this event possible: call this a .
- We are recognizing all the outcomes from the experiment: call this b .
- We are calculating:

$$\Pr(A) = \frac{a}{b}.$$

¹Actor (Malayalam cinema mainly). Movie recommendations: Kumbalangi Nights, C U Soon, Joji

The above are examples of events that are *random*. The probabilities associated with them explain a pattern of their randomness.

In the *Statistics* portion of this workshop, we will learn to study randomness on the computer.

Randomness in R

(All codes used here can be found in `Lec1.R`). Run the following codes in R to

Tossing a fair coin

```
# Let's toss a fair coin:  
  
# n = 1 means draw 1 coin  
# size = 1 means it's a coin toss  
# prob = .5 means a fair coin  
rbinom(n = 1, size = 1, prob = .5)
```

Change `.5` above to get different $\Pr(\text{Heads})$.

Rolling a die

```
# Let's do a die roll  
  
# n = 1 means draw 1 coin  
# size = 1 means it's a coin toss  
# prob = .5 means a fair coin  
sample(1:6, size = 1)
```

Break for Worksheets
