# MIT Introduction to Statistics 18.05 Slides 4 - Questions

## John Hancock

### February 20, 2017

## Contents

## 1 References and License

We are answering questions in the material from MIT OpenCourseWare course 18.05, Introduction to Probability and Statistics.
Please see the references section for detailed citation information.
The material for the course is licensed under the terms at `http://ocw.mit.edu/terms`.
We are answering the questions that Orloff and Bloom ask in [2].
We use documentation in [3] to write LATEXsource code for this document.

## 2 Conditional Probability of Unknown Die

The first question Orloff and Bloom give in [2] is:

1. The Randomizer holds the 6-sided die in one fist and the 8-sided die in the other.

2. The Roller selects one of the Randomizers fists and covertly takes the die.

3. The Roller rolls the die in secret and reports the result to the table.

Given the reported number, what is the probability that the 6-sided die was chosen?

We draw a probability tree to get started on a solutionn. We refer to the section titled, "Shorthand vs. precise trees," in [1] for guidance on drawing the tree below.

$C$ is the event that the Roller selects the cube shaped 6-sided die.

$O$ is the event that the Roller selects the octohedron shaped 8-sided die.

$C1, C2, \ldots, C6$ are the events that the Roller rolls one, two, or so on to six.

$O1, O2, \ldots, O8$ are the events that the Roller rolls one, two, or so on to eight.
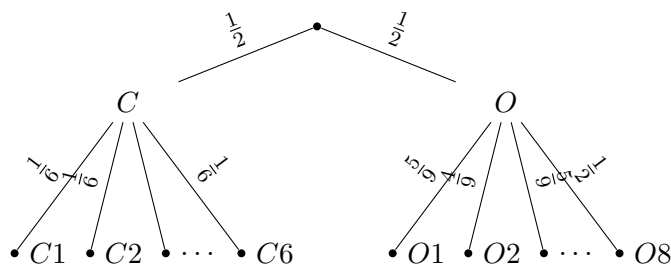


# References

[1] Jeremy Orloff and Jonathan Bloom. *Conditional Probability, Independence and Bayes Theorem Class 3, 18.05, Spring 2014.* Available at `https://ocw.mit.edu/courses/mathematics/18-05-introduction-to-probability-and-statistics-spring-2014/readings/MIT18_05S14_Reading3.pdf` (Spring 2014).

[2] Jeremy Orloff and Jonathan Bloom. *Discrete Random Variables; Expectation 18.05 Spring 2014 Jeremy Orloff and Jonathan Bloom.* Available at `https://ocw.mit.edu/courses/mathematics/18-05-introduction-to-probability-and-statistics-spring-2014/class-slides/MIT18_05S14_class4slides.pdf` (Spring 2014).

[3] ShareLaTex. *Typesetting quotations.* Available at `https://www.sharelatex.com/learn/Typesetting_quotations` (Spring 2014).