

MITx: 6.008.1x Computational Probability and Inference

Heli



- Introduction
- 1. Probability and Inference

Introduction to Probability (Week 1)

Exercises due Sep 22, 2016 at 02:30 IST

(A)

Probability Spaces and Events (Week 1)

Exercises due Sep 22, 2016 at 02:30 IST

Random Variables (Week 1)

Exercises due Sep 22, 2016 at 02:30 IST

Jointly Distributed Random Variables (Week 2)

Exercises due Sep 29, 2016 at 02:30 IST

Conditioning on Events (Week 2)

Exercises due Sep 29, 2016 at 02:30 IST

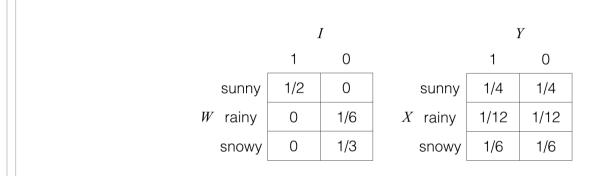
1. Probability and Inference > Jointly Distributed Random Variables (Week 2) > Exercise: Conditioning for Random Variables

■ Bookmark

Exercise: Conditioning for Random Variables

(4 points possible)

Consider the following two joint probability tables.



• What is $p_{W|I}(\mathrm{sunny}|1)$?

1			
' '			

? Answer: 1

• What is $p_{X|Y}(\text{sunny}|1)$?

Exercise: Conditioning for Random Variables | Jointly Distributed Random Variables (Week 2) | 6.008.1x Courseware | edX

Homework 1 (Week 2)

Homework due Sep 29, 2016 at 02:30 IST

Ø.

(A)

(A)

Inference with Bayes' Theorem for Random Variables (Week 3)

Exercises due Oct 06, 2016 at 02:30 IST

Independence Structure (Week 3)

Exercises due Oct 06, 2016 at 02:30 IST

Homework 2 (Week 3)

Homework due Oct 06, 2016 at 02:30 IST

Notation Summary (Up Through Week 3)

Mini-project 1: Movie Recommendations (Weeks 3 and 4)

Mini-projects due Oct 13, 2016 at 02:30 IST

Decisions and Expectations (Week 4)

Exercises due Oct 13, 2016 at 02:30 IST

Measuring Randomness (Week 4)

Exercises due Oct 13, 2016 at 02:30 IST

1/2

? Answer: 0.5

• What is $p_{I|W}(1|\mathrm{snowy})$?

0

? Answer: 0

• What is $p_{Y|X}(1|\mathbf{snowy})$?

1/2

? Answer: 0.5

Solution:

• What is $p_{W|I}(\operatorname{sunny}|1)$?

Solution:

$$p_{W|I}(\mathrm{sunny}|1) = rac{p_{W,I}(\mathrm{sunny},1)}{p_I(1)} = rac{1/2}{p_I(1)}.$$

Meanwhile,

$$p_I(1) = 1/2 + 0 + 0 = 1/2.$$

Towards Infinity in Modeling Uncertainty (Week 4)

Exercises due Oct 13, 2016 at 02:30 IST

Homework 3 (Week 4)

Homework due Oct 13, 2016 at 02:30 IST

Thus combining the above two equations,

$$p_{W|I}(ext{sunny}|1) = rac{1/2}{p_I(1)} = rac{1/2}{1/2} = oxed{1}.$$

• What is $p_{X|Y}(\mathbf{sunny}|1)$?

Solution:

$$p_{X|Y}(\mathrm{sunny}|1) = rac{p_{X,Y}(\mathrm{sunny},1)}{p_Y(1)} = rac{1/4}{p_Y(1)}.$$

Meanwhile,

$$p_Y(1) = 1/4 + 1/12 + 1/6 = 1/2.$$

Thus combining the above two equations,

$$p_{X|Y}(ext{sunny}|1) = rac{1/4}{p_Y(1)} = rac{1/4}{1/2} = oxed{1/2}.$$

• What is $p_{I|W}(1|\mathbf{snowy})$?

Solution:

$$p_{I|W}(1| ext{snowy}) = rac{p_{W,I}(ext{snowy},1)}{p_W(ext{snowy})} = rac{0}{p_W(ext{snowy})} = \boxed{0}.$$

• What is $p_{Y|X}(1|\mathbf{snowy})$?

Solution:

$$p_{Y|X}(1| ext{snowy}) = rac{p_{X,Y}(ext{snowy},1)}{p_X(ext{snowy})} = rac{1/6}{p_X(ext{snowy})}.$$

Meanwhile,

$$p_X(\text{snowy}) = 1/6 + 1/6 = 1/3.$$

Thus combining the above two equations,

$$p_{Y|X}(1| ext{snowy}) = rac{1/6}{p_X(ext{snowy})}. = rac{1/6}{1/3}. = iggl[1/2iggl].$$

You have used 0 of 5 submissions

© All Rights Reserved



© 2016 edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.

















