

MITx: 6.008.1x Computational Probability and Inference

Heli

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# Introduction to Probability (Week 1)

Exercises due Sep 22, 2016 at 02:30 IST

## 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

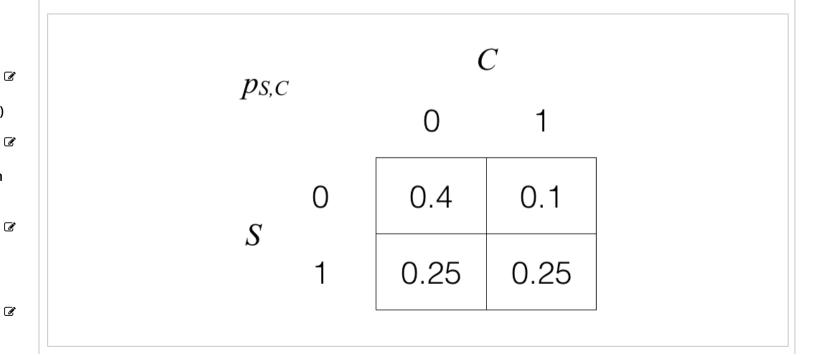
1. Probability and Inference > Homework 2 (Week 3) > Homework Problem: Ice Cream Sales in Inferenceville

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### Homework Problem: Ice Cream Sales in Inferenceville

(10/10 points)

You have been hired to investigate a disturbing connection between ice cream sales and crime in Inferenceville. You are given a report that describes the joint distribution over random variable S, representing ice cream sales, and random variable C, representing crime. Each variable takes on a value of "low" or "high", which we'll represent with 0 and 1 respectively. The joint distribution (estimated from data) is as follows:



#### Homework 1 (Week 2)

Homework due Sep 29, 2016 at 02:30 IST

t Ø

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

Exercises due Oct 06, 2016 at 02:30 IST

**B** 

# Independence Structure (Week 3)

Exercises due Oct 06, 2016 at 02:30 IST

**B** 

### 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)

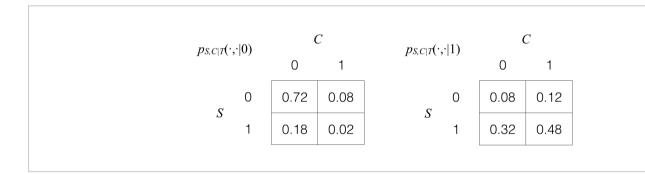
Exercises due Oct 13, 2016 at 02:30 IST

•	<b>(a)</b> Are	random	variables	$\boldsymbol{S}$	and (	C	inde	pend	ent?
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0	Yes				

● No ✔

• **(b)** After further investigation, you discover information about the temperature, represented by T. This random variable also takes on values 0 or 1 corresponding again to "low" and "high". You are able to obtain the conditional distribution  $p_{S,C|T}(s,c\mid t)$ , shown below.



Are random variables  $oldsymbol{S}$  and  $oldsymbol{C}$  conditionally independent given  $oldsymbol{T}$ ?

O No

Homework Problem: Ice Cream Sales in Inferenceville | Homework 2 (Week 3) | 6.008.1x Courseware | edX

### **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

• (c) Determine the distribution  $p_T$  from the tables above. Express your answer as a Python dictionary. The keys should be the Python integers 0 and 1.

{0:0.5,1:0.5}

You have used 2 of 5 submissions

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