

CSC384 S19 A4 Module 1 (Version A)

Total points **20/20** ?

This module is worth 20 points. Your last submission will be used for the final score. You may attempt this module 5 times without penalty. After 5 attempts, each additional attempt will result in a penalty of 5% (e.g., On your 7th attempt, you obtain a score of 18 points. Then, your final score for this module will be $18 - (2 \times 1) = 16$ points.)

If you encounter any problems with the assignment, please email zheweisun@cs.toronto.edu with [CSC384 A4] in the subject. Be sure to include the module number and version.

Section score **0/0**

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M1P1 - Probability Theory

Section score 9/9

What is Bayes' Rule?

1/1

- ☐ $\Pr(B|A) = \Pr(A|B)\Pr(A) / \Pr(B)$
- ☐ $\Pr(B|A) = \Pr(A,B)\Pr(A) / \Pr(B)$
- ☐ $\Pr(B|A) = \Pr(B)\Pr(A)$
- ☒ $\Pr(B|A) = \Pr(A|B)\Pr(B) / \Pr(A)$

[True/False] $\Pr(A \cup B) = \Pr(A) + \Pr(B) - \Pr(A \cap B)$

1/1

- ☒ True
- ☐ False

[True/False] If A and B are independent, $\Pr(B|A) = \Pr(B)$

1/1

- ☒ True
- ☐ False

[True/False] If A and B are independent, $\Pr(B, A) = \Pr(B)$

2/2

- ☐ True
- ☒ False

[True/False] If A and B are independent, $\Pr(B, A) = \Pr(B|A)$ 2/2

☐ True

☒ False

[True/False] $\Pr(A) \in [0,1]$ 1/1

☒ True

☐ False

[True/False] $\Pr(A)*P(B) \in [0,1]$ 1/1

☒ True

☐ False

M1P2 - Dice Rolls

Hermione has four dice in her beaded handbag: one tetrahedron (4 sides), one hexahedron (i.e., cube, 6-sides), and two octahedra (8 sides). Hermione secretly grabs one of the four dice at random. Let S be the number of sides on the chosen die. Now, she rolls the chosen die without showing it to you. Let R be the result of the roll.

Section score 11/11

What is $P(S=6)$?

1/1

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.250

What is $P(R=4)$?

1/1

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.167

What is $P(S=8 \mid R=3)$?

2/2

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.375

What is $P(S=6 \mid R=5)$?

2/2

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.400

Which die is most likely if $R = 5$?

2/2

☐ $S = 4$

☐ $S = 6$

☒ $S = 8$

Now, Hermione rolls a tetrahedron and a hexahedron at the same time. Let $A = \text{'sum of two dice equals 5'}$

How many atomic or possible events are there in the joint probability distribution of the rolled dice? 1/1

24

What is $P(A)$? 2/2

Your answer should be between 0 and 1, rounded to 3 digits after the decimal (e.g. 0.120).

0.167

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