2.3 QUIZ QUESTION 1 (1/1 point)

Suppose that

1. If there is no traffice jam, it takes you 15 minutes to get to work.

2. If there is a traffic jam, it takes you 40 minutes.

3. The probability that there is a traffic jam is 0.1

What is the expected value of the time in minutes to get to work? Give your answer to one decimal place (e.g. 15.0).

17.5 ✔ **Answer:** 17.5

17.5

E[TIME] = E[TIME|JAM]P[JAM]+E[TIME|NOT JAM]P[NOT JAM] = 40*0.1+15*0.9=17.5.

You have used 1 of 3 submissions

2.3 QUIZ QUESTION 2 (1/1 point)

Suppose we have two bits, labelled by c and d, where

1. The probability that bit c is 1 is p_c = 0.4

2. The probability that bit d is 1 is p_d = 0.7

Denote the entropies (in units of bits) of c and d by H_c and H_d respectively.

Which one of the following is true?

◉ $H_c > H_d$ ✔

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- $H_c = H_d$
- $H_c < H_d$
- $H_c > 1$

One way to answer this question is to calculate the entropy according to the definition, e.g.

$$H_c = p_c log_2 p_c + (1 - p_c) log_2 (1 - p_c)$$

You can also reason this out without calculation. The entropy is a measure of uncertainty. The entropy of a single bit in bits is at most one, and achieves its maximum when p, the probability of one, is 0.5. This is when there is the most uncertainty about the value of the bit. It achieves its minimum value when p equals 0 or 1. The more uncertain the source, the higher its entropy is. Since p_c is closer to 0.5 than p_d, the value of bit c is more uncertain and it has a higher entropy.

You have used 1 of 2 submissions