Answer to Quiz1 Monday

The probability that the dice in Penny's and Shelton's hands display different numbers can be calculated as follows:

Solution 1:
Let x be the number of the first dice, and y be the number of the second dice. The result Penny rolled can be represented as (x,y).

To meet the condition that Penny randomly gives one dice to Shelton, which is observed to show a 6, at least one of penny's two dice is 6.

So, the sample space is (1,6), (2,6), (3,6), (4,6), (5,6), (6,6), (6,1), (6,2), (6,3), (6,4), (6,5), in which each event has the same probability.

Only (6,6) display the same numbers. So, the probability that the dice in Penny's and Shelton's hands display different numbers is 10/11.

Solution 2:
Let A be the event that two dices display different numbers.
Let B be the event that at least one dice is 6.

We want to calculate the probability P(A|B).
According to the conditional probability:

$$P(A|B) = \frac{P(A,B)}{P(B)} = \frac{\frac{10}{36}}{\frac{11}{36}} = \frac{10}{11}$$

Grading:

1	Submit the answer.
2	Mention sample space or conditional probability.
3	The sample space is listed correctly, or the conditional probability formula is correct.
4	The steps are correct, but the final calculation is wrong.
5	The steps and the final calculation are correct.

Answer to Quiz1 Tuesday

Solution:

Prior from training:

P(HK-related) = 3/4

P(Macao-related) = 1/4

Likelihoods from training:

P(HK | HK-related) = (5+1) / (8+6)

P(PolyU| HK-related) = (1+1) / (8+6)

P(HK| Macao-related) = (1+1) / (3+6)

P(PolyU| Macao-related) = (0+1) / (3+6)

Here we remove the stop word “the”.

Scoring the test set:

Let S be the test document.

P(HK-related) P(S|HK-related) = 3/4 * (6*2)/(14*14) $\approx$ 0.0459

P(Macao-related) P(S|Macao-related) = 1/4 * (2*1)/(9*9) $\approx$ 0.0062

0.0459 > 0.0062. So document “the HK PolyU” is classified as HK-related.

Grading:

1	Submit the answer.
2	Mention Prior or Likelihoods.
3	Correctly calculating Prior and Likelihoods.
4	The steps are correct, but the final calculation is wrong.
5	The steps and the final calculation are correct.