**TIE4203 Decision Analysis in Industrial & Operations Management**
**Tutorial #2**

## Question 1

**P3.1** Suppose you can choose either Deal *A* or Deal *B*, and you get to keep whatever you might win.

- **Deal *A***: A coin is flipped. When it lands, if the side facing up is Heads, you win $1000, otherwise nothing.
- **Deal *B***: A die is rolled. If the side facing up is a One, you win $1000, otherwise nothing.

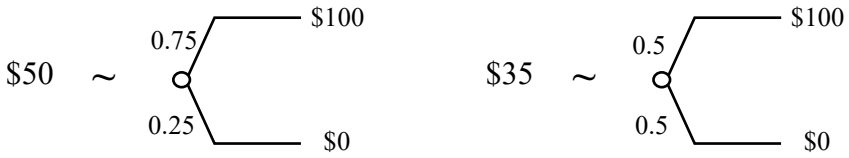
**(*a*)** Which deal would you choose to own, Deal *A* or Deal *B*? Why?

**(*b*)** Suppose now the coin is flipped and the die is rolled. The results are a Tails and a One. Do you think you had made a good decision? Why or why not.

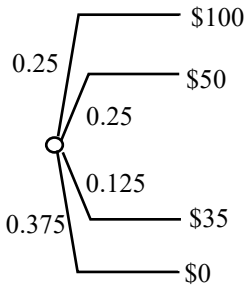
**(*c*)** If you were given another opportunity to choose between Deal *A* and Deal *B* before flipping the coin and rolling the die again, which would you select?

## Question 2

**P3.2** Jo has certainty equivalents for two deals as follows:

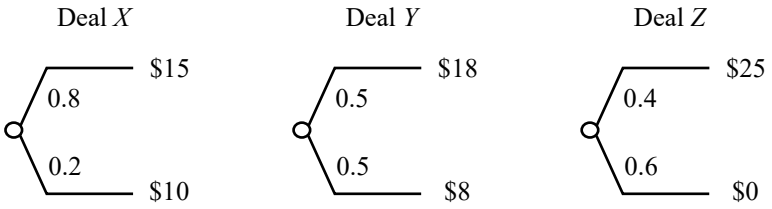



Use the substitution rule to determine Jo's certainty equivalent for the following deal:



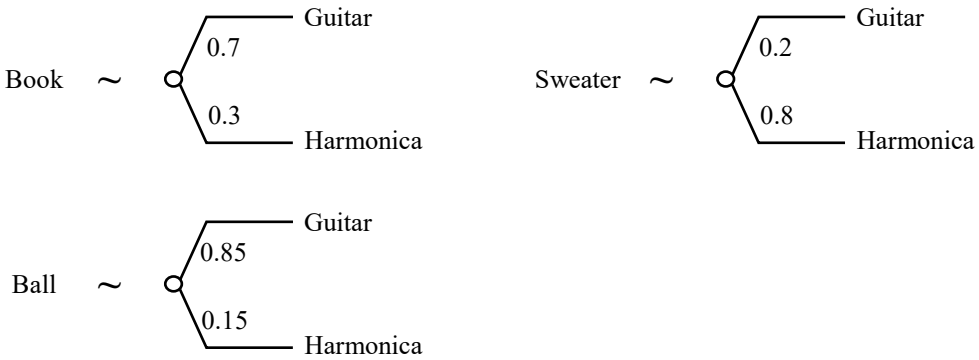
## Question 3

**P3.3** John is rushing to the box office to buy ticket to see a new play. He gets to the counter and realizes that he left his wallet at home. He has only $3 change, and the ticket costs $20. A local philanthropist, Mr. Ho, steps up and offers John his choice of three deals for free, which he will resolve immediately. All John cares about is getting a ticket to the play, and there is no time to get more money elsewhere or use other forms of payment. Which deal should John choose?



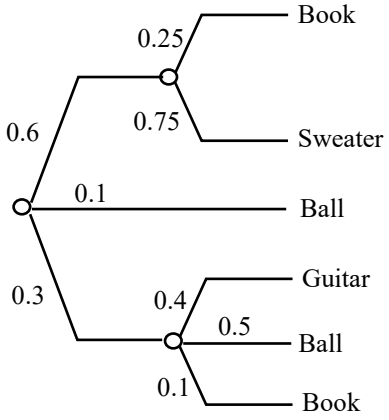

## Question 4

**P3.4** Chris prefers a guitar to a harmonica, and specifies the following equivalence relations:

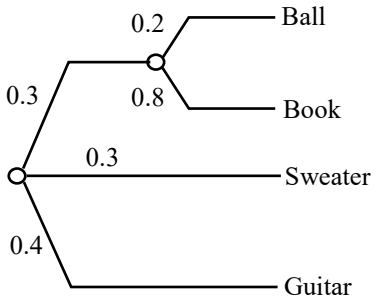



**(*a*)** What is Chris's preference ordering for the guitar, harmonica, the book, the sweater, and the ball?

**(*b*)** What is Chris's preference probability (with respect to a hypothetical Guitar-Harmonica deal) that is equivalent to the following deal?



**(*c*)** Does Chris prefer a book or the following deal? (Hint: first express this deal as a probability of a guitar versus a harmonica.)



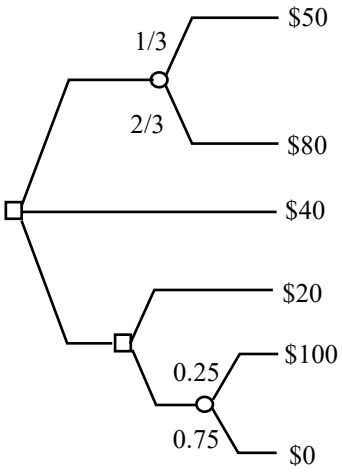

**(*d*)** What can we infer about Chris's preference for four sweaters versus one book, from her statements above?

## Question 5

**P4.2** Kim has the following probabilities for deals with \$100 as the best outcome and \$0 as the worst outcome.

| Value (\$) | Preference probability |
|---|---|
| 0 | 0 |
| 10 | 0.17 |
| 20 | 0.32 |
| 40 | 0.57 |
| 50 | 0.67 |
| 80 | 0.89 |
| 90 | 0.95 |
| 100 | 1 |

What is Kim's certainty equivalent for the following opportunity?

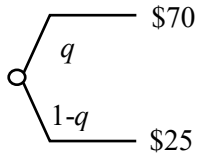


## Question 6

**P4.3** Connie has the preference probabilities listed below:

| Value ($) | Preference probability |
|---|---|
| 0 | 0 |
| 25 | 0.3 |
| 40 | 0.5 |
| 70 | 0.8 |
| 100 | 1.0 |

Connie is offering a deal to her friend Sam, who has $40 to spend. The dollar values on the deal are shown below, but the probabilities have yet to be determined.




Using only the information available (and without worrying about whether Sam will want to buy the deal), what is the value of $q$ for which Connie is indifferent to selling or not selling the deal for $40?