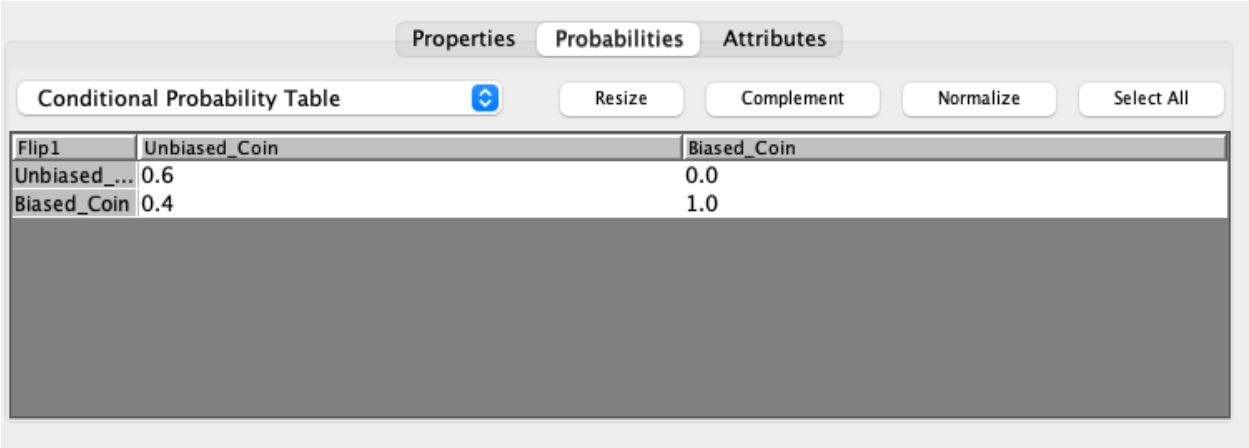
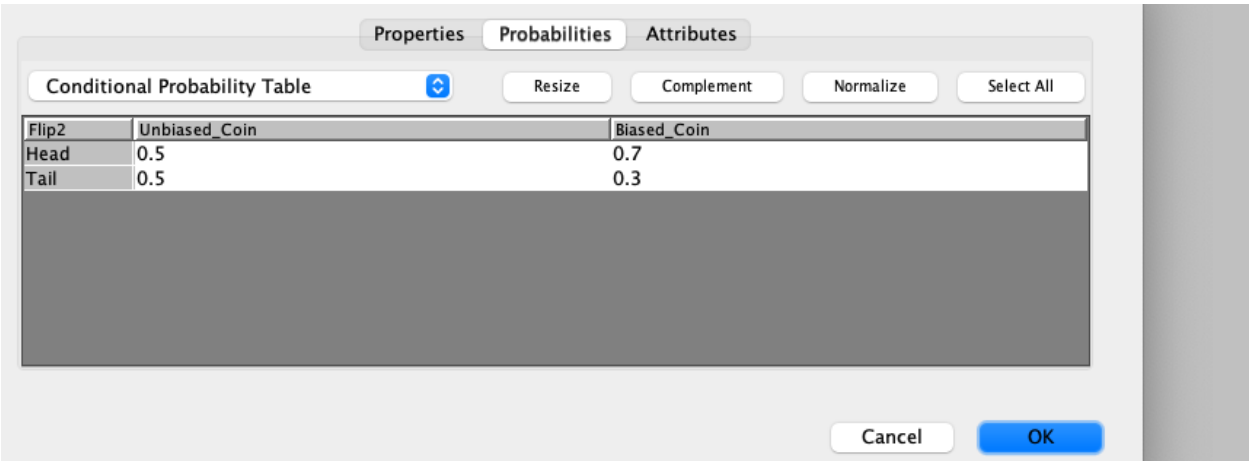
Part 1

We have 8 Flip, with the first flip only using the unbiased coin. For Flip 2 to Flip 8, we have the following probability for getting an unbiased coin or biased coin. Take note that when a biased coin is used, the remaining Flip will only use a biased coin by giving a probability of 1.



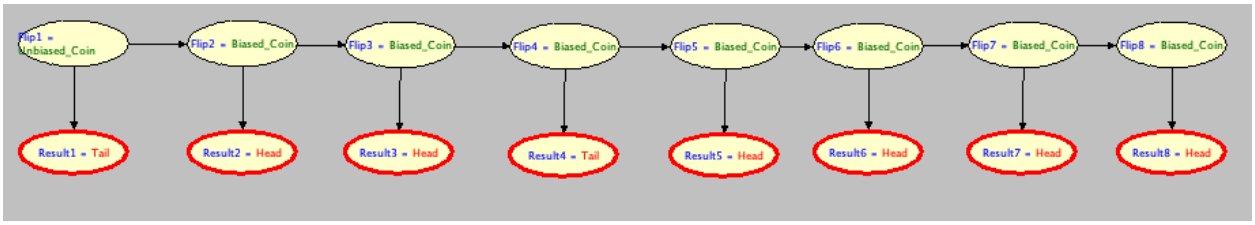
Flip1	Unbiased_Coin	Biased_Coin
Unbiased_...	0.6	0.0
Biased_Coin	0.4	1.0

For Result 1 to Result 8, we have the following probabilities for getting head or tail.



Flip2	Unbiased_Coin	Biased_Coin
Head	0.5	0.7
Tail	0.5	0.3

Lisa managed to perform a coin switch from unbiased coin to biased coin. The coin switch in the second flip, in the image shows that it switch during Flip 2 when we set the given results.



Part 2
The probabilistic query for solving this problem is the MAP query.

P(MAP|e)
MAP we are trying to find is F_1 to F_8
The evidence, e is R_1 = T, R_2 = H, R_1 = H, R_4 = T, R_5 = H, R_6 = H, R_7 = H, R_8 = H
Such that F_1= Flip 1 and R_1 = Result 1

MAP query = argmax $_{F1, \ldots, F8}$ P(F_1, … ,F_8 | R_1 = T, R_2 = H, R_1 = H, R_4 = T, R_5 = H, R_6 = H, R_7 = H, R_8 = H)

The results obtained are illustrated in the Figure below.