**Issues I’m having understanding the solution to Question 6 in Problem Set #3…**

I may not completely understand the wording of the question. However, given what I think the question is asking, my issues are…

1. Why should the customer returning the next day impact the original marginal probabilities of ordering a Burger (40%) or Taco (60%). If this were true, wouldn’t this violate the assumption of independence between what any two customers order? Even if it’s the same customer, intuitively I would think that subsequent orders by that customer should still be independent. However, let’s say that the marginal probabilities did change – as suggested by the solution – then how can the original conditional matrix P(Size | Meal) be used with the revised marginal probabilities for P(Meal)?
2. I think the question is driving at figuring out the probability P(Size = Texas Sized). If this were the case isn’t the  
   P(Size = Texas Sized) simply equal to 43% - given the assumption of independent events? Algebraically, however, the solution is calculating this marginal probability by multiplying two conditional probabilities together as follows…

The problem I’m having is that algebraically I don’t think this solve for the marginal probability P(Size). If the second conditional matrix (shown above) is derived by the applying Bayes’ Theorem to the original marginal probabilities (of both Meal and Size) and the original conditional matrix P(Size | Meal), then how can any of the marginal probabilities change? If they did then wouldn’t this invalidate the original conditional matrix and lead to a circularity that would make it impossible to apply Bayes’ Theorem?