1.   Wanting to vacation in Los Angeles, Mike, who lives in Kansas City, can take direct flights on either of two airlines. Let the conditional indirect utility for airlines A and B, respectively, be

$$\hat{U}_A = Y - p_x + \alpha p_A + \gamma t_A + \beta_1 Y + \varepsilon_A$$
$$\hat{U}_B = Y - p_x + \alpha p_B + \gamma t_B + \beta_2 Y + \varepsilon_B$$

where Y is income, p_x is the price of all other goods, p_A is the price on airline A, p_B is the price on airline B, and t_A and t_B are the travel times on airlines A and B, respectively. ε_A and ε_B represent unobserved taste variations. α, γ, β_1, and β_2 are parameters.

   (a)   Mike's conditional indirect utility for airline A does not depend on either the price or the travel time on airline B. Similarly, his conditional indirect utility for airline B does not depend upon the price or travel time on airline A. If Mike decides to fly on airline A, does this decision imply that the price and travel time on airline B had no effect on Mike's choice of airline A?

   (b)   If $\beta_1 = \beta_2$, does Mike's conditional indirect utility depend upon his income? If so, why; and if not, why not?

2.   Norman has to decide between purchasing a pickup (PU) or a sport utility (SU) vehicle. His conditional indirect utility for each type of vehicle is

$$\hat{U}_{PU} = Y - p_x + \alpha p_{PU} + \beta_1 Y + \varepsilon_{PU}$$
$$\hat{U}_{SU} = Y - p_x + \alpha p_{SU} + \beta_2 Y + \varepsilon_{SU}$$

where Y is income, p_x is the price of all other goods, $p_{PU,}$ is the price of the pickup truck, and p_{SU} is the price of the sport utility. ε_{PU} and ε_{SU} represent unobserved taste variations for each of the vehicle types. α, β_1, and β_2 are parameters.

   (a)   Based upon the above conditional indirect utilities, make the appropriate assumptions necessary to derive a binary logit model of vehicle type choice. What is the probability that Norman will purchase a pickup truck? What is the probability that he will choose a sport utility vehicle?

   (b)   Evaluate the following statement: "Suppose Norman is considering the purchase of a pickup truck with an *equally priced* sport utility vehicle. If income has the same marginal effect upon Norman's conditional indirect utility of pickup trucks as it has on sport utility vehicles, then Norman has an equal probability of choosing either vehicle."

   (c)   What is the difference between a *generic* variable and an *alternative specific* variable? In the above model, is vehicle price a generic or alternative specific variable? How about income?