Math 151, Spring 2011
Jo Hardin
WU # 2

Name: _____

Consider occupations that are grouped into upper (U), middle (M), and lower (L) levels. Glass & Hall (1954) compiled the following data on occupational mobility for men in England and Wales. Each entry represents the probability that a son would be in a particular income level (subscript 2) given that his father was in any of the three income levels (subscript 1).

	U_2	M_2	L_2
U_1	0.45	0.48	0.07
M_1	0.05	0.70	0.25
L_1	0.01	0.50	0.49

Suppose the fathers' generation had 10% U, 40% M, and 50% L, what is the probability that a randomly selected son is in the upper level of occupation?

Solution:

$$\begin{aligned} P(U_2) &= P(U_2 \cap U_1) + P(U_2 \cap M_1) + P(U_2 \cap L_1) \\ &= P(U_2|U_1)P(U_1) + P(U_2|M_1)P(M_1) + P(U_2|L_1)P(L_1) \\ &= 0.45 \cdot 0.10 + 0.05 \cdot 0.40 + 0.01 \cdot 0.50 \\ &= 0.07 \end{aligned}$$