Problem Wk.10.1.5: Where are you?

We're trying to locate someone in a two-story building that has four rooms on each floor. We can represent the floor they're located on with a random variable that has domain (ie sample space) (`'f1'`, `'f2'`) and what room they're in with a random variable with domain (`'r1'`, `'r2'`, `'r3'`, `'r4'`). Our initial belief about their location is such that:

- we believe it's equally likely they're on floor 1 or floor 2
- if they're on floor 1, then they're equally likely to be in any of the rooms
- if they're on floor 2, then there's a 0.7 chance of being in room 4, and a 0.1 chance of being in any of the other rooms.

1. What is the DDist for *P(floor)*?

   Enter the probabilities below; use 3 decimal digits of precision.

   DDist('f1': [____] , 'f2': [____])

2. What is the DDist for *P(room | floor='f1')*?

   Enter the probabilities below, use 3 decimal digits of precision.

   DDist(
   'r1': [____] , 'r2': [____] ,
   'r3': [____] , 'r4': [____])

3. What is the DDist for *P(room | floor='f2')*?

   Enter the probabilities below; use 3 decimal digits of precision.

   DDist(
   'r1': [____] , 'r2': [____] ,
   'r3': [____] , 'r4': [____])

4. What is the Joint Distribution over (room, floor)?

   Enter the probabilities below; use 3 decimal digits of precision.

   DDist(
   '(f1,r1)': [____] , '(f1,r2)': [____] ,
   '(f1,r3)': [____] , '(f1,r4)': [____] ,
   '(f2,r1)': [____] , '(f2,r2)': [____] ,
   '(f2,r3)': [____] , '(f2,r4)': [____])

5. Now, we find out for sure that he's in room 1. What is the DDist for *P(floor | room = 'r1')*?

   Enter the probabilities below; use 3 decimal digits of precision.

   DDist('f1': [____] , 'f2': [____])

6.01SC Introduction to Electrical Engineering and Computer Science
Spring 2011