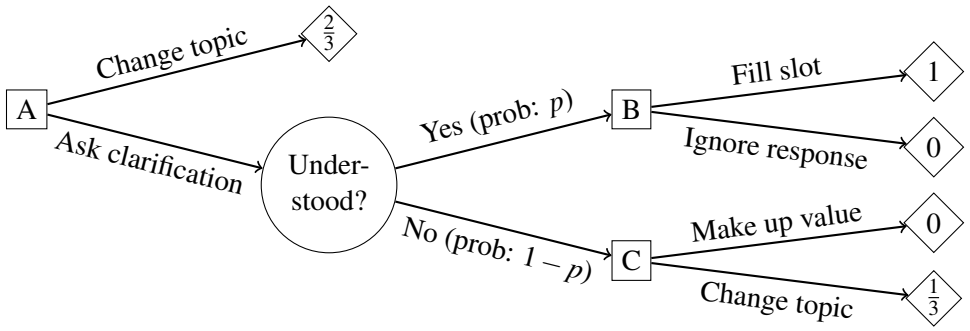
Problem 3. A dialogue agent has the following information for making decisions, shown as a decision tree. Square nodes are places the agent can make a choice about which action to take. Circle nodes represent observations by the agent based on the informartion received; each observation has a probability. The diamond-shaped leaf nodes represent the utility (or reward) for going down a certain path.



a. (3 points) Assume that the agent decided to ask a clarification question at node A. What is the best policy at this point, that is, the policy that maximizes the expected utility? (Write it as a set of if-then statements, dependent on the observation.)

b. (3 points) What is the expected utility of this policy, as a function of the probability p?

c. (4 points) For which values of p is the policy of changing topic at node A optimal?