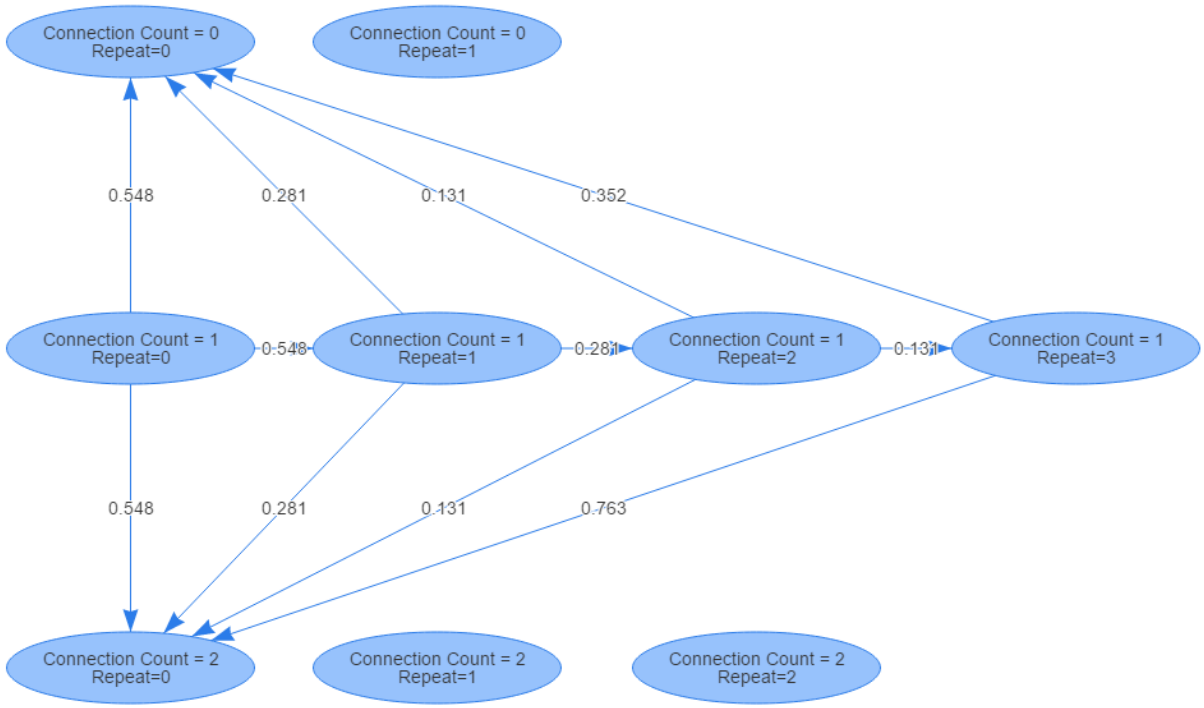
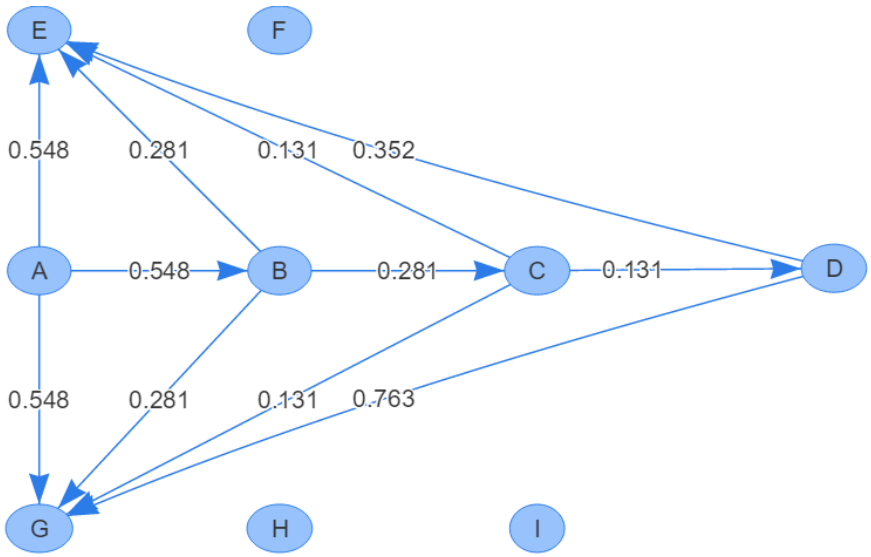
As far as I understand this is the definition of a markov chain:

$$P(S_i|S_{i-1}) = P(S_i|S_{i-1}, S_{i-2}, S_{i-3}, \dots)$$

Basically the probability of going to state S_i is only dependent on which state we were one step before. This is actually the case for my model. This is the model once again:



Now look at it this way:



Lets consider $P(C|B)$. We have:

$P(C|B) = 0.281$

This value is independent on how we arrived at B. That means:

$P(C|B) = P(C|B,G,A) = P(C|B,A) = 0.281$

Additional Notes: In the picture above the numbers written on the edges are just random numbers. In the actual model the numbers outgoing from each node add up to 1.

Additional Notes: The actual graph looks something like this. I've omitted a lot of the edges for simplicity: