Hidden Markov models

1. Consider a single intercross individual derived from two inbred mouse strains. Consider $M$ ordered markers, and let $G_i \in \{AA, AB, BB\}$ denote the (phase-unknown) genotype of the individual at marker $i$. Show that the $G_i$ form a Markov chain.

2. Fill in the details in the Viterbi algorithm to calculate

$$\hat{g} = \arg \max_{g_1, \ldots, g_M} \Pr(G_1 = g_1, \ldots, G_M = g_M \mid O)$$