Computational Biology
Assignment 2 - Report

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1. I would expect the distribution of nucleotides not to change much given that the rate of change is slow.
2. In that case, I expect the distribution of the nucleotides to approach the distribution of the equilibrium frequencies.
3. We see that each row of the transition matrix Q approaches the initial nucleotide distribution π after approximately 600 mya.
4. For a nucleotide i, randomly sampling from the exponential distribution with rate $\lambda = -q_{ii}$.
5. One could use the rate of change of each probability given nucleotide i where each probability is given by:

$$\left(\frac{\alpha}{\sum_{i \in \alpha\beta\gamma} i}; \frac{\beta}{\sum_{i \in \alpha\beta\gamma} i}; \frac{\gamma}{\sum_{i \in \alpha\beta\gamma} i} \right)$$