$$\Pr(D|T) = \Pr\left(\begin{matrix}\text{CCT}\\ \text{GTT}\\ \text{CCG}\end{matrix} \;\middle|\; \begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \end{matrix}\right)$$ which we'll write as $$\Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{CCT} & \text{GTT} & \text{CCG}\end{matrix}\right)$$

i $$\Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{CCT} & \text{GTT} & \text{CCG}\end{matrix}\right) = \Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)\Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{C} & \text{T} & \text{C}\end{matrix}\right)\Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{T} & \text{T} & \text{G}\end{matrix}\right)$$

ii $$\Pr\left(\begin{matrix} & t_1 & \\ t_3 & & t_2 \\ & t_4 & \\ \text{C} & \text{G} & \text{C}\end{matrix}\right) = \Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ \text{A} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)+\Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ \text{C} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)+\Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ \text{G} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)+\ldots$$

$$\ldots+\Pr\left(\begin{matrix} & \text{T} & \\ & t_1 & \\ \text{G} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)+\Pr\left(\begin{matrix} & \text{T} & \\ & t_1 & \\ \text{T} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right)$$

iii $$\Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ \text{A} & & t_2 \\ t_3 & & t_4 \\ \text{C} & \text{G} & \text{C}\end{matrix}\right) = \Pr(\text{A at root})\Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ \text{A} & & \\ & & \end{matrix}\right)\Pr\left(\begin{matrix} & \text{A} & \\ & t_1 & \\ & & t_2 \\ & & \text{C}\end{matrix}\right)\Pr\left(\begin{matrix} & \text{A} & \\ & & \\ t_3 & & \\ \text{C} & & \end{matrix}\right)\Pr\left(\begin{matrix} \text{A} & & \\ & t_1 & \\ & & t_4 \\ & & \text{G}\end{matrix}\right)$$