



# Dual n-gram LM

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**Ensuring a unique play for any sequence of tokens and to  
model it as a probability distribution**

$$P_1[\langle \textcolor{black}{/}\mathbf{s} \rangle \mid \langle \mathbf{s} \rangle] = P_2[\langle \textcolor{brown}{/}\mathbf{s} \rangle \mid \langle \mathbf{s} \rangle] = 0 \quad (1)$$

$$P_1[\langle \mathbf{s}\mathbf{w} \rangle \mid \langle \mathbf{s} \rangle] + P_2[\langle \mathbf{s}\mathbf{w} \rangle \mid \langle \mathbf{s} \rangle] = 1 \quad (2)$$

$$P_1[\langle \mathbf{s}\mathbf{w} \rangle \mid \langle \mathbf{s}\mathbf{w} \rangle] = P_2[\langle \mathbf{s}\mathbf{w} \rangle \mid \langle \mathbf{s}\mathbf{w} \rangle] = 0 \quad (3)$$

$$P_1[\langle \textcolor{black}{/}\mathbf{s} \rangle \mid \langle \mathbf{s}\mathbf{w} \rangle] = P_2[\langle \textcolor{brown}{/}\mathbf{s} \rangle \mid \langle \mathbf{s}\mathbf{w} \rangle] = 0 \quad (4)$$

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$$P_1[\langle /s \rangle \mid \langle s \rangle] = P_2[\langle /s \rangle \mid \langle s \rangle] = 0 \quad (1)$$

$$P_1[\langle sw \rangle \mid \langle s \rangle] + P_2[\langle sw \rangle \mid \langle s \rangle] = 1 \quad (2)$$

$$P_1[\langle sw \rangle \mid \langle sw \rangle] = P_2[\langle sw \rangle \mid \langle sw \rangle] = 0 \quad (3)$$

$$P_1[\langle /s \rangle \mid \langle sw \rangle] = P_2[\langle /s \rangle \mid \langle sw \rangle] = 0 \quad (4)$$

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