

Рассмотрим последовательность с вкраплениями, задаваемую следующим образом:

$$\begin{aligned} 1 - \nu_1, \\ \dots, \\ k - \nu_k \end{aligned}$$

где τ_s - длина серии, а ν_s - количество серий длины τ_s Тогда контейнер Y примет вид:

$$y_1, \dots, y_T = y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k}, \quad (1)$$

где $\sum_{s=1}^k s\nu_s = T$

Рассмотрим случай когда $y_1 \neq y_2$:

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ \frac{1}{2} \left(\frac{1}{2} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} \right) \left(\frac{1}{2} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s} \right) = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s} \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 1, \dots, \gamma_{\nu_{s_j}s_j} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s + 1}, 1 < j < k \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 1, \dots, \gamma_{\nu_{s_j}s_j} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s + 1}, 1 < j < k \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 0, \dots, \gamma_{\nu_{s_j}i} = 1, \dots, \gamma_{\nu_{s_j}s_j} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 2} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s} (1 + \varepsilon^2), 1 < j < k, 1 < i < j \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 1, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 1\} = \\ = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} \end{aligned}$$

Рассмотрим случай когда $y_1 = y_2$:

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 1, \dots, \gamma_{\nu_{s_j}s_j} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s + 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1}, 1 < j < k \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 0, \dots, \gamma_{\nu_{s_j}s_j} = 1, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 2}, 1 < j < k \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_j}1}, \dots, y_{\nu_{s_j}s_j}, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \\ \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_j}1} = 0, \dots, \gamma_{\nu_{s_j}s_j} = 1, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} (1 + \varepsilon^2), 1 < j < k, 1 < i < j \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 1, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}s_1} = 1, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} \end{aligned}$$

$$\begin{aligned} P\{y_{\nu_{s_1}1}, \dots, y_{\nu_{s_1}j}, \dots, y_{\nu_{s_1}s_1}, \dots, y_{\nu_{s_k}1}, \dots, y_{\nu_{s_k}s_k} | \gamma_{\nu_{s_1}1} = 0, \dots, \gamma_{\nu_{s_1}j} = 1, \dots, \gamma_{\nu_{s_1}s_1} = 0, \dots, \gamma_{\nu_{s_k}1} = 0, \dots, \gamma_{\nu_{s_k}s_k} = 0\} = \\ = \frac{1}{2^{T+1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s + 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1}, 1 < j < s_1 \end{aligned}$$

Тогда

$$\begin{aligned} P\{Y | w(\gamma) = 0\} = \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s} + \frac{1}{2^T} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1} = \\ \frac{1}{2^{T-1}} (1 + \varepsilon)^{T - \sum_{s=1}^k \nu_s - 1} (1 - \varepsilon)^{\sum_{s=1}^k \nu_s - 1}, w(\gamma) = \sum_{i=1}^T \gamma_i - \text{вес Хемминга} \end{aligned}$$

$$P\{Y|w(\gamma) = 1\} = \frac{1}{2^T}(1 + \varepsilon)^{T - \sum_{s=1}^k \nu_{s-1} - 2} (1 - \varepsilon)^{\sum_{s=1}^k \nu_{s-2}} \left(-\frac{3}{2}\varepsilon^4 - \frac{5}{2}\varepsilon^3 - \frac{5}{2}\varepsilon^2 + \frac{3}{2}\varepsilon + 7 \right)$$

Отсюда

$$\begin{aligned} P\{Y\} &= P\{Y|w(\gamma) = 0\} + \delta P\{Y|w(\gamma) = 1\} = \frac{1}{2^{T-1}}(1 + \varepsilon)^{T - \sum_{s=1}^k \nu_{s-1}} (1 - \varepsilon)^{\sum_{s=1}^k \nu_{s-1}} + \\ &\quad \delta \left(\frac{1}{2^T}(1 + \varepsilon)^{T - \sum_{s=1}^k \nu_{s-1} - 2} (1 - \varepsilon)^{\sum_{s=1}^k \nu_{s-2}} \left(-\frac{3}{2}\varepsilon^4 - \frac{5}{2}\varepsilon^3 - \frac{5}{2}\varepsilon^2 + \frac{3}{2}\varepsilon + 7 \right) \right) = \\ &\quad \frac{1}{2^{T-1}}(1 + \varepsilon)^{T - \sum_{s=1}^k \nu_{s-1} - 2} (1 - \varepsilon)^{\sum_{s=1}^k \nu_{s-2}} \left((1 + \varepsilon)(1 - \varepsilon) - \delta \left(\frac{3}{4}\varepsilon^4 + \frac{5}{4}\varepsilon^3 + \frac{5}{4}\varepsilon^2 - \frac{3}{4}\varepsilon - \frac{7}{2} \right) \right) \end{aligned}$$