

No 7

$n = 200$

$$P(k) = \frac{\lambda^k}{k!} e^{-\lambda}$$

$$H_0: \text{Матрица } \mathcal{E} \sim P(k)$$

$$H_1: \overline{H_0}$$

$$i \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad \dots$$

$$m_i \quad 109 \quad 65 \quad 22 \quad 3 \quad 1$$

$$p_i \quad e^{-\lambda} \quad \lambda e^{-\lambda} \quad \frac{\lambda^2 e^{-\lambda}}{2} \quad \frac{\lambda^3 e^{-\lambda}}{6} \quad \frac{\lambda^4 e^{-\lambda}}{24}$$

ОМПГ

$$L = (e^{-\lambda})^{109} \cdot (\lambda e^{-\lambda})^{65} \cdot \left(\frac{\lambda^2 e^{-\lambda}}{2}\right)^{22} \cdot \left(\frac{\lambda^3 e^{-\lambda}}{6}\right)^3 \cdot \left(\frac{\lambda^4 e^{-\lambda}}{24}\right)^1 =$$
$$= \lambda^{65} \cdot \lambda^{44} \cdot \lambda^9 \cdot \lambda^4 \cdot e^{-(109+65+22+3+1)\lambda} \cdot \frac{1}{2^{22} \cdot 6^3 \cdot 24^1}$$

$$\ln L = 122 \ln \lambda - 200 \lambda - \ln e$$

$$\frac{\partial \ln L}{\partial \lambda} = \frac{122}{\lambda} - 200 = 0 \Rightarrow \tilde{\lambda} = 0,61$$



$$\rightarrow \frac{d^2 \ln L}{d\lambda^2} = -\frac{122}{\lambda^2} < 0 \quad \forall \lambda \Rightarrow \max$$

$$\Delta \sim \chi^2(k-1-m) = \chi^2(5-1-1) = \chi^2(3)$$

$$\tilde{p}(k) = \frac{0,61^k}{k!} e^{-0,61}$$

$$\hat{i} \quad 0 \quad 1 \quad 2 \quad 3 \quad 4$$

$$np_i \quad 108,67 \quad 66,29 \quad 20,22 \quad 4,11 \quad 0,63$$

$$\begin{aligned} \tilde{\Delta} = & \frac{(109-108,67)^2}{108,67} + \frac{(65-66,29)^2}{66,29} + \\ & + \frac{(22-20,22)^2}{20,22} + \frac{(3-4,11)^2}{4,11} + \frac{(1-0,63)^2}{0,63} \approx \end{aligned}$$

$$\approx 0,700$$

$$p\text{-value} = \int_{0,7}^{+\infty} q(t) dt = \int_{0,7}^{+\infty} \frac{\sqrt{t} \cdot e^{-\frac{t}{2}}}{\sqrt{2\pi}} dt \approx 0,873$$

$$p\text{-value} > \alpha = 0,05 \Rightarrow$$

\Rightarrow нет оснований отвергнуть H_0