№6

$\alpha = 0{,}05$

$n = 200$

	A_1	A_2	A_3
ξ	0	1	2
n_i	10	181	9

$H_0: \xi \sim B(2; \tilde{\Theta})$

$$P(x) = \sum_{k=0}^{n} C_n^k \tilde{\Theta}^k (1-\tilde{\Theta})^{n-k} \delta(x-k)$$

$$p_1 = C_2^0 (1-\tilde{\Theta})^2 = (1-\tilde{\Theta})^2$$

$$p_2 = C_2^1 \tilde{\Theta}(1-\tilde{\Theta}) = 2\tilde{\Theta}(1-\tilde{\Theta})$$

$$p_3 = C_2^2 \tilde{\theta}^2 (1-\tilde{\theta}) = \tilde{\theta}^2$$

$$\tilde{\theta}_1 = \frac{10}{200} \quad \tilde{\theta}_2 = \frac{181}{200} \quad \tilde{\theta}_3 = \frac{9}{200}$$

$$\tilde{\Delta} = \sum_{i=1}^{3} \frac{(m_i - np_i)^2}{np_i} \quad \hat{\Delta} \sim \chi^2(m-1) = \chi^2(2)$$

$p_i = P(A_i) = f(\tilde{\theta})$ - нельзя найти

ОМП:

$$L(\theta) = (1-\theta)^{2\cdot 10} (2\theta(1-\theta))^{181} \theta^{2\cdot 9} =$$

$$= 2^{181} \theta^{199} (1-\theta)^{201}$$

$$\ln L(\tilde{\theta}) = 181 \ln 2 + 199 \ln \theta + 201 \ln(1-\theta)$$

$$\ln L(\theta)' = \frac{199}{\theta} - \frac{201}{1-\theta} \to \tilde{\theta} = \frac{199}{400}$$

А это максимум???

$$\frac{\partial^2 \ln \theta}{\partial \theta^2} = -\frac{199}{\theta^2} - \frac{201}{(1-\theta)^2} < 0 \to \text{max}!!!$$

=> по 1

$$\tilde{\Delta} = \ldots = 131$$

$$p\text{-value} = P(\Delta \geq \hat{\Delta} \mid H_0) = \int_{\hat{\Delta}}^{+\infty} \rho(t)_{\chi^2} dt =$$

$$= \int_{131}^{+\infty} \frac{e}{2}^{-\frac{t}{2}} dt \approx 3.58 \cdot 10^{-29} < 0.05$$

$\Rightarrow$ у нас огромное желание отвергнуть H_0