Tõenäoseim sündmuse toimumiste arv

Kõige tõenäosem sündmuse A toimumiste arv on k_0, mille puhul P_{n,k_0} on maksimaalne. Sellisel juhul kehtivad järgmised võrratused:

$$P_{n,k_0} \geq P_{n,k_0+1}$$

$$\frac{n!}{k_0!(n-k_0)!}p^{k_0}q^{n-k_0} \geq \frac{n!}{(k_0+1)!(n-k_0-1)!}p^{k_0+1}q^{n-k_0-1}$$

$$\frac{p^{k_0}q^{n-k_0}}{n-k_0} \geq \frac{p^{k_0+1}q^{n-k_0-1}}{k_0+1}$$

$$\frac{q}{n-k_0} \geq \frac{p}{k_0+1} \quad |(n-k_0)(k_0+1) \qquad (n \in N; k_0 \in N; n \geq k_0)$$

$$q(k_0+1) \geq p(n-k_0)$$

$$qk_0 + q \geq pn - pk_0$$

$$pk_0 + qk_0 \geq pn - q$$

$$(p+q)k_0 \geq pn - q \qquad (p+q=1)$$

$$k_0 \geq pn - q$$

$$P_{n,k_0} \geq P_{n,k_0-1}$$

$$\frac{n!}{k_0!(n-k_0)!}p^{k_0}q^{n-k_0} \geq \frac{n!}{(k_0-1)!(n-k_0+1)!}p^{k_0-1}q^{n-k_0+1}$$

$$\frac{p^{k_0}q^{n-k_0}}{k_0} \geq \frac{p^{k_0-1}q^{n-k_0+1}}{n-k_0+1}$$

$$\frac{p}{k_0} \geq \frac{q}{n-k_0+1} \quad |k_0(n-k_0+1) \qquad (n \in N; k_0 \in N; n \geq k_0)$$

$$p(n-k_0+1) \geq qk_0$$

$$pn - pk_0 + p \geq qk_0$$

$$qk_0 + pk_0 \leq pn + p$$

$$(p+q)k_0 \leq pn + p \qquad (p+q=1)$$

$$k_0 \leq pn + p$$

$$pn - q \leq k_0 \leq pn + p$$