It is proved, that the described systems $\boldsymbol{PI}^-$ and $\boldsymbol{PM}^-$ are p-simulated by resolution system $\mathfrak{R}$, which is p-simulated by the system $\mathcal{E}$, therefore we can describe the sets of tauts, of the length ℓ, the proofs complexities of which in the both systems $\boldsymbol{PI}^-$ and $\boldsymbol{PM}^-$ are accordingly $o(\ell), o(\ell^2), o(\ell^3), \ldots, o(2^{\frac{\ell}{2}})$ (the similar result for the system $\mathcal{E}$ is proved by Anahit Chubaryan earlier).

▶ ANDREJ MUCHNIK AND ALEXEI SEMENOV, *Frequency and universal approaches to randomness of finite sequences*.
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Kolmogorov in [1] formalized von Mises's frequency approach to randomness of finite sequences. A sequence is called random if the frequency of ones is almost the same in all subsequences chosen by simple rules of choice. More formally, a sequence of length L is called (n, ε, p)-*random* with respect to the set of rules $\mathcal{R}_L$ if the difference between the frequency of ones and p is $< \varepsilon$ in any subsequence of length $> n$ chosen by a rule belonging to $\mathcal{R}_L$. Kolmogorov showed that

1. for any L, $\varepsilon > 0$, p, and $n > \varepsilon^{-4}$ if cardinality of $\mathcal{R}_L$ is $< \mathrm{e}^{2n\varepsilon^2(1-\varepsilon)}$, then there exists (n, ε, p)-random sequence;
2. there exists $\mathcal{R}_L$ of cardinality $< 2^{4n\varepsilon(1+5\varepsilon)}$ such that there are no $(n, \varepsilon, 0.5)$-random sequences.

We remove the difference between these bounds (this problem was stated in [1]): there exists a set $\mathcal{R}_L$ of cardinality $< \mathrm{e}^{\frac{2n\varepsilon^2(1+\varepsilon)}{1-n/L}}$ such that any sequence is non-random with respect to $\mathcal{R}_L$.

Another problem under consideration is a correlation between universal (belonging to small simple set) and frequency randomness. *A specific deficiency* of a set $S \subseteq \{0,1\}^L$ is $(1 - \log_2 |S|/L)$. A set of great deficiency is small (and consists of "universally non-random" sequences). A rule r is *normal* if r chooses subsequences of the same length from all sequences of length L; a set is *regular* if for some ε and a normal rule r it consists of all sequences such that r chooses subsequences with deviation of frequency from $1/2$ greater than ε (elements of regular sets are "frequency non-random"). We prove that if $\delta > 0$ is small enough, then every set of specific deficiency $> \delta$ can be covered by $L(1/\delta)^{1/\delta}$ regular sets of specific deficiency $> \frac{\delta}{\ln(1/\delta)}(1 - \frac{2\ln\ln(1/\delta)}{\ln(1/\delta)})$. This bound for possible deficiency of covering regular sets is sharp, since there exists a set of specific deficiency $> \delta$ that cannot be covered by $2^{L\delta^5/3}$ regular sets of specific deficiency $> \frac{\delta}{\ln(1/\delta)}(2 + \frac{\ln\ln(1/\delta)}{\ln(1/\delta)})$.

Also we formulate and prove algorithmic analogs of all previous results in terms of Kolmogorov complexity.

[1] A. N. KOLMOGOROV, *On tables of random numbers*, ***Sankhyã: The Indian Journal of Statistics, Series A***, vol. 25, part 4 (1963). (Reprinted in ***Theoretical Computer Science***, 207(1998), pp. 387–395).

▶ NIKOLAJ NIKITCHENKO, *Logics of equitone predicates and their applications*.
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Let $\langle D, \leq \rangle$ be a preordered set. A partial predicate $p \in P\ (= D \to \mathrm{Bool})$ is *equitone*, if for any $d, d' \in D$ such that $d \leq d'$ and $p(d)$ is defined, follows that $p(d')$ is defined and $p(d) = p(d')$. The class of all equitone predicates over D is denoted by PE.

Much of the significance of equitone predicates comes from the large number of important