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THE THEORETICAL FOUNDATIONS OF THE MODELING MASS SERVICE SYSTEMS

The vast majority of phenomena and processes that computer science explores are complex. It is necessary to build mathematical models to study them. Data on the purpose and operating conditions of the studied system serve as initial information when building mathematical models of system functioning processes. This information determines the main purpose of the simulation, the requirements for the mathematical model, the level of abstraction, the choice of the mathematical modeling scheme, etc.

The mathematical model of the simulation object (system) is represented as a set of values describing the process of functioning of the real system. The following subsets are most often used in the description:

- set of X - input influences on the system;
- a set of influences of the external environment;
- set of internal (own) parameters of the system;
- set of initial characteristics of the system.

One of the most studied systems is the mass service system (MSS), the process of functioning of which is, in fact, the service process, which consists in providing one or another service, which is determined by the functional purpose of the system. Typical service systems include repair and medical services, transportation systems, airports, train stations, etc. Such systems have gained special importance in information processes. These are primarily computer systems, information transmission networks, operating systems, databases and data banks. The experience of modeling various types of discrete systems shows that approximately 80% of these models are based on MSS.

Each MSS consists of a certain quantity of service units (also called service channels (these are machines, robots, communication lines, cashiers, sellers, etc.)) and is designed to serve a certain flow of the applications (requirements) arriving at certain random moments of the time.

Service of the request continues for some time, after that the channel becomes free and ready to receive the next request. The random nature of the application flow and service time leads to the fact that in some periods of time a large number of applications accumulates at the entrance of the MSS (they either enter the queue or leave the SMO unserved). In other periods, the MSS will work with underload or be completely idle.

The operation process of the MSS is a random process with discrete statuses and continuous time.

The MSS status changes leap-like at the time of certain events (the arrival of a new application, the end of service, the moment when an application that cannot wait leaves the queue).

The process of functioning of the MSS generally includes the following stages: receipt of requirements; waiting (if necessary) in line; service in the device; output of the request from the system. It is necessary to describe: the process of receiving applications into the system; application maintenance process in the system; service discipline to formalize the MSS.

If the intervals of receipt of all applications are constant, then such a flow is called deterministic or regular. But, as a rule, the arrival intervals are random variables, and the corresponding flow of applications is called stochastic or random.

To describe the stochastic flow (stochastic transfer process) of applications, it is necessary to specify the distribution function of the random arrival interval for each application.

For this we can use: the method of inverse functions, the method of piecewise linear approximation, modeling a random variable based on empirical data, selection method or different mathematical methods of generating random numbers (congruent (linear) method, Lemer's algorithm, mixed generator, additive generators, McLaren-Marsal method, arithmetic procedures, quadratic congruent method and etc.).

For the simulation of MSS there is a need to use mathematical methods of generating random numbers in order to avoid repetitions. therefore, the prospects for further scientific investigations are the use of Pearson, Kolmogorov and Student criteria to determine the subordination of distributions to one law or a certain model. As well as a statistical evaluation of the parameters of the equal probability distribution and calculation of all the characteristics of the investigated MSS.

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ZOMBIES: MECHANISMS OF FORMATION AND FUNCTIONING OF THEIR BRAINS

Zombies are one of the most mysterious and enigmatic subjects, often the subject of discussion in literature, film and scientific research. The concept of a zombie varies depending on cultural contexts and creative imaginations, but there is a certain consensus that it is a creature that is in a state of uncontrollable behaviour and has limited brain function. In this essay, we will consider various theories about how zombies are formed and how their brains work.

1. Historical overview of the zombie concept.

The first references to zombies have their roots in African and Caribbean mythology, where they are associated with religious rites and magical practices. However, the concept of zombies has also been explored in modern science, where scientific explanations for their existence and brain activity were sought.

2. Mechanisms of zombie formation.

There are various hypotheses regarding the mechanisms of zombie formation, including chemicals, infectious diseases and psychological influences. One hypothesis is the use of the tetrodotoxin poison, which can cause a state of paralysis and reduced consciousness, turning a person into a controlled creature. Other studies point to the possibility of using other poisons or microorganisms that affect brain activity.