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An interactive web application to promote effective learning of computer networking concepts

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Abstract:

Many concepts in computer networks, such as reliable data transfer protocols and congestion control mechanisms exhibit a high degree of complexity due to the interaction of several independently acting entities that form a distributed system. For instance, congestion control mechanisms adapt to changes of the packet arrival rates of the participating hosts, whereas dynamic routing algorithms may choose new routes depending on the current network conditions. This project aims to develop a web application that enables students to directly interact with systems and algorithms in the context of computer networks and observe the impact of various changes to the setting. Moreover, we anticipate that the use of gamification techniques, such as a series of increasingly difficult challenges that students can attempt to solve, will help to keep students motivated to engage with the application over a longer period of time and promote self-learning of the involved concepts.