Teaching
Mathematics and
Computer Science

An interactive animation for learning sorting algorithms: How students reduced the number of comparisons in a sorting algorithm by playing a didactic game

Ladislav Végh and Veronika Stoffová

Abstract. Learning programming and understanding algorithms is one of the hardest tasks for novice computer science students. One of the basic algorithms they learn during the introductory programming and algorithms courses are the sorting algorithms. Students like learning these and other algorithms by animations and didactic games, however, these animations are not educationally useful in every case. In this article, we present our educational sorting game, which can be used to introduce the topic of sorting algorithms. The didactic game can be used later too, as a demonstrative tool for explaining the more efficient, quicksort algorithm. We conducted a pedagogical experiment, in which we examined the process of development of sorting algorithms by students while they used the mentioned didactic game. The results showed that students were able to create an algorithm to solve the sorting problem, and they improved its effectiveness by reducing the number of comparisons in the algorithm. They were also able to understand the importance of the efficiency of algorithms when we demonstrated them the quicksort algorithm using the same tool after the experiment.

Key words and phrases: teaching algorithms, game-based animation.

ZDM Subject Classification: U60.

LADISLAV VÉGH
J. SELYE UNIVERSITY
KOMÁRNO, SLOVAKIA

E-mail: veghl@ujs.sk

VERONIKA STOFFOVÁ
TRNAVA UNIVERSITY
TRNAVA, SLOVAKIA

E-mail: `veronika.stoffova@truni.sk`