

Abstract: The Post correspondence problem, introduced in 1946 by Emil Post, is an important example of undecidable problem. Therefore PCP figures in proofs of some results in theory of formal languages, matrix theory and other. The decidability of the Post correspondence problem proved Ehrenfeucht, Karhumäki and Rozenberg in the 1980s and Halava, Harju and Hirvensalo in 2002 ended the proof. Eight years later was verified that the solution can be found even in polynomial time.

The main goal of this diploma thesis is to describe this algorithm in detail and to implement it in a web application. The thesis also introduces basics of combinatorics on words and some facts about PCP and produces some interesting examples of instances of PCP.

Keywords: Post correspondence problem, generalized Post correspondence problem, binary PCP, polynomial algorithms on words, successors of morphisms