Minicourse I: Graphs and their automorphism groups

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In mathematics we usually tend to study structures that admit a certain degree of symmetry. In graphs the degree of symmetry is given by the automorphism group which is the group of all adjacency preserving permutations of its vertex set.

In this course we introduce various families of graphs with a rather large degree of symmetry such as vertex-transitive graphs, edge-transitive graphs and arc-transitive graphs. We review some of the methods for constructing such graphs and present some results from the rich theory that has developed in the last few decades. We also present some open problems in the area.

The course contains 8 lectures.

This course is organized in the frame of the international cooperation between Slovenia and Russia in 2014-2015.