

2 Project – submit your solution to petr.kovar@vsb.cz

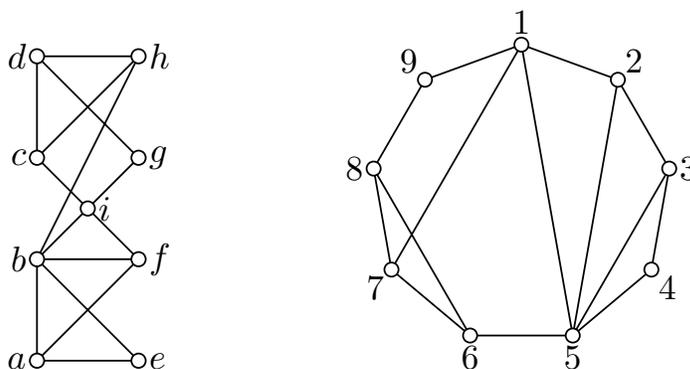
If you speak Czech, please submit the project to odevzdavarna ilkqp64.

Combinatorics

- 2.1. There is a piano keyboard with 88 keys. How many different tritone chords (even dissonant) can be played, if 10 keys is the maximum possible difference between the highest and lowest tone in the chord? Tritone chord is chord consisting of three different notes. (2 b)
- 2.2. How many permutations of n elements contain a cycle longer than $\frac{n}{2}$ (in the cycle notation)? (3 b)

Graph Theory

- 2.3. Decide if G_1 and G_2 are isomorphic. If yes, exhibit an isomorphism $\varphi : V(G_1) \rightarrow V(G_2)$. If not, prove that (e.g. show that one of the two graphs has a certain property and the other doesn't). (3 b)



Obrázek 1: Graphs G_1 and G_2 .

- 2.4. What is the maximum number of components that arise from an eulerian graph G by removing two edges? (an eulerian graph is connected and every vertex in the graph has even degree.) Justify your answer. (2 b)

Guidelines

Write the project using a computer, include the title with your name, student ID, number of the project, year and a grading table (see the sample project). The project will contain a detailed description of your solution for each problem. If you skip a problem, mark it clearly in the text by saying „*I did not solve the problem number X*“.

Submit your project to petr.kovar@vsb.cz as an uncompressed PDF file, use your student ID in the name of your submitted file.

You will be awarded 0 upto 2 or 0 upto 3 points for each of the problems.

Submit your project no later than on **Monday 7.12.2015 at 23:59**.