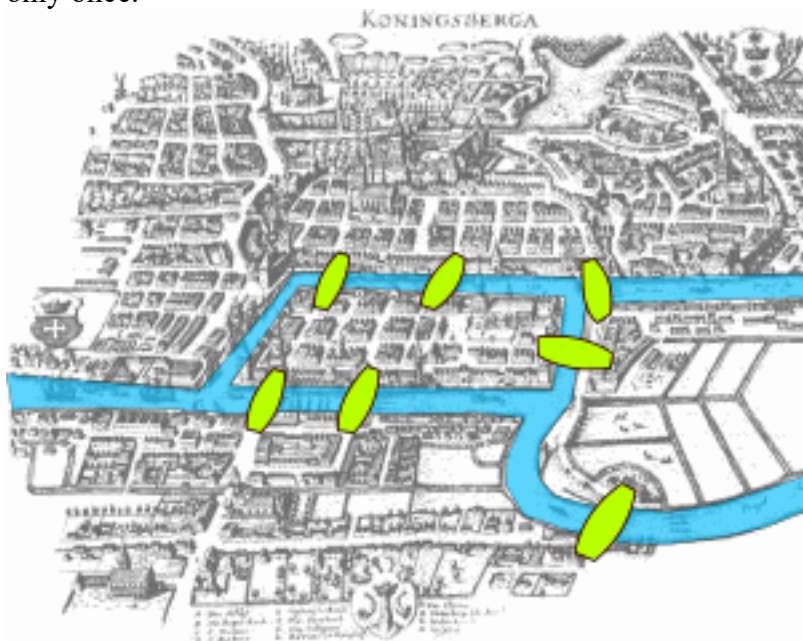


UWO Math 2124 Fall 2019
 Introduction to Mathematical Problems
 Instructor: Rasul Shafikov
 Handout: Oct 22

Example 4.1 During a certain lecture, each of five mathematicians fell asleep exactly twice. For each pair of these mathematicians, there was some moment when both were sleeping simultaneously. Prove that, at some moment, some three of them were sleeping simultaneously.

Example 4.2 Seven Bridges of Königsberg problem: the city of Königsberg in Prussia was set on both sides of the Pregel River, and included two large islands - Kneiphof and Lomse - which were connected to each other, or to the two mainland portions of the city, by seven bridges. The problem was to devise a walk through the city that would cross each of those bridges once and only once.



More generally: find the conditions on a connected graph (or pseudograph) for which it is possible to take a walk that visits every edge exactly once.

Example 4.3 Two men are located at opposite ends of a mountain range, at the same elevation. If the mountain range never drops below this starting elevation, is it possible for the two men to walk along the mountain range and reach each other's starting place, while always staying at the same elevation?

