Bacherol degree

The theme of the work is Fair Divisions and divisions of perfectly divisible things. We will present their applications and different ways to solve problems from the point of view of mathematics, relating to everyday life.

At the beginning, we will present the definition of fair division. Next, we will describe the most important events, which had a great influence on the development of this issue.
In the first chapter, we will present the Steinhaus method of dividing a cake into two people.

Later, we will characterize the Steinhaus Algorithm for dividing a cake between three people. In the next part of the chapter, we will extend the problem for an infinite number of people, which is presented by the Banach-Knaster Algorithm.

In the second chapter we will define the concept of a simplex and its properties and the most important definitions will be explained. Next, we will describe simplicial divisions and their applications.

In the third chapter, we will discuss Sperner's Lemma for two-dimensional simplexes, this is the so-called Sperner coloring. In the second part of the chapter, we will discuss the Forest Simmons Algorithm, in which one can see a direct application of Sperner's Lemma.