## Introduction

This lesson introduces a variety of number systems, which play an important role in mathematics and especially in computer science. This unit also explains how to calculate in these number systems and how to convert numbers from one system to another. All number systems have one thing in common: they each use a specially marked number as a base (also called radix). All numbers of the system can then be written as sums of powers of this base number.

In everyday life, everyone already performs calculations in the decimal system. There are numbers 0, 1, 2, ..., 9 and the number 10 is used as the base number. The value of a digit in

corresponds to a number of a power with a base of 10, i.e., = 100, a number depends on its position. For example, if you look at the number 424, the first 4 has the value 400, while the second 4 has the value 4. In the decimal system, each digit

etc., which is multiplied by the corresponding digit at this position. For example, the number 424 is formed as .

Other number systems are defined in a very similar way, but use a base number and a different set of digits. In the following lessons we will start by looking at the decimal system and defining the numbers from it more precisely. We’ll then look at other important systems such as the binary and hexadecimal systems.