[Introduction to algorithms]

We hear about algorithms all the time in every-day life – and perhaps with a lot more glamour and mystery surrounding them than is necessary. In particular, algorithms today are often associated with artificial intelligence.

However an algorithm is essentially just a set of instructions – what then differentiates it from a cooking recipe or Ikea instructions is that usually algorithms are designed in order to solve general problems. At the more superficial end, algorithms can be used for calculation. The process we use to add decimal numbers by breaking them down into units, tens, and hundreds can correctly be referred to as an addition algorithm. However more complicated algorithms might be designed to search for a particular and best solution, for example, with the shopping couples, we could design an algorithm that enumerates all the potential combinations of couples and returns the one that satisfies our initial conditions.

The concept of the algorithm can be traced back at least as far as the 9th century and the Persian mathematician, Al-Khwarizmi, however with the rise of computing technology in the 20th century, the notion has become more formalized, in particular by mathematicians such as Turing (who you might remember if you've seen "The Imitiation Game").

Beyond being a set of step-by-step instructions, a key thing we need to keep in mind when designing algorithms is that such instructions need to be unambiguous and comprehensible to a computer. Something implied here (and it's certainly the case) is that in order for a computer to "comprehend" something, it needs to have a language, and the sophistication and complexity of that language will determine how precise such instructions need to be. Although we can write algorithms without specifying a language (this is referred to as pseudocode), we often need to become familiar with terminology

and commands in order to implement them. In topic 2, we'll look at some programming languages that have a limited number of drag and drop instructions.