Imagine a mini-Olympic torch tour running between 4 cities in the UK, with the following constraints:

- The torch starts and finishes in London
- The torch should pass each city once and only once
- The following table lists the distance between each city
  (in miles as measured by Google Maps)

	London	Cambridge	Bath	Coventry
London	0	50	96	86
Cambridge	50	0	120	70
Bath	96	120	0	80
Coventry	86	70	80	0

- What is the shortest route?
- How can you be sure it is the shortest?
- How many different routes are there?

Let's now try a slightly longer tour of 5 cities. We'll add Oxford to the list:

	London	Cambridge	Bath	Coventry	Oxford
London	0	50	96	86	60
Cambridge	50	0	120	70	65
Bath	96	120	0	80	54
Coventry	86	70	80	0	46
Oxford	60	65	54	46	0

- What is the shortest route now?
- How many different possible routes did you need to consider?

Is there an efficient way to work out the number of different possible routes when there are 10 cities? 15 cities?...

Suppose a computer could calculate one million routes per second. How long would it take to find the optimal route for 10 cities? 15 cities? 20 cities?