Practical 14: Common Birthdays

Task 1

What are the chances of at least two people sharing the same birthday (just day and month) in a class of 40 people (such as your practical class for example)?

In this practical you are expected to write a Java program to find the (approximate) answer to the above question using the Monte Carlo approach (i.e. experimentally, by simulating the above scenario many times, say 10,000).

There are 365 days in a year (ignoring leap years) and therefore one of 365 possible birthdays for a single person. To simplify things, let us not bother with day and month and just designate one simple number to each day of the year. So January 1st would be day 1, January 2nd would be day 2, …, February 1st would be day 32, … and December 31st would be day 365.

Before you start writing code make sure that you understand the problem. Then think: how would you go about solving it on paper if you had access to 10,000 classes of 40 people and you could ask each person their birthday? The structure of your code will not be very different.

You are expected to use **efficient** coding practices to solve this problem. Too much repetition of *similar* lines of code is an indication of inefficient coding practices.

Answer: There is around 89% chance that at least two people in a group of 40 will have the same birthday so don't be surprised if you come up with such high probability!

Task 2

Now change your program (or better, a copy of it) in order to find the same probability (i.e. of at least two people in a class sharing the same birthday) but with different class size each time ranging from 2 to 100 people.

Using the output of your program deduce when it is almost certain to find at least two with the same birthday. In other words, in a class of how many people it will almost be certain that at least two will have the same birthday?