

### [nex82] Coincident birthdays

The assumption in this exercise is that birthdays are randomly distributed across a year of 365 days with uniform probability.

- (a) If you are one of  $k$  persons at a party, what is the probability  $Q(k)$  that at least one person shares your birthday?
- (b) What is the minimum size of the group for which  $Q(k)$  exceeds 10%, 50%, 90%?
- (c) In a group of  $n$  children, what is the probability  $P(n)$  that at least two kids have their birthday on the same day?
- (d) What is the minimum size of that group for which  $P(n)$  exceeds 10%, 50%, 90%?

**Solution:**