8. Birthday attack.

There are 365 possible birthdays. when there's only one person, that person can born on any day out of 365 days so $\frac{365}{365} = 1.00$.

How about when there are two students?
The first student A can be born on any day $\frac{365}{365}$
But the second student B can only be born on any day other than the day that student A was born so $\frac{364}{365}$

Probability that both of them were born on different days.

$$364 = 365 - (2-1)$$

$$P = \frac{365}{365} \cdot \frac{364}{365}$$

Suppose there are n student that we want to know this type of probability of. the denominator won't change from 365 but numerator seem to change for n students.

$$365, \ 365(2-1), \ 365-(3-1), \ \cdots, \ 365-((n-1)-1), \ 365-(n-1)$$

And we are thinking about 40 students for this problem so .

$$P(40 \text{ students born on different day}) = \frac{365}{365} \cdot \frac{364}{365} \cdot \frac{363}{365} \cdot \frac{362}{365} \cdots$$
$$\cdot \frac{327}{365} \cdot \frac{326}{365}$$

$$= 0.10876819$$