

**Info:** The code should be as fast and concise as possible. The readability of the code is secondary, but comments are desired.

## Challenge 5

There are exactly ten ways of selecting three from five, 12345:

123, 124, 125, 134, 135, 145, 234, 235, 245, and 345

In combinatorics, we use the notation,  $\binom{5}{3} = 10$ .

In general,  $\binom{n}{r} = \frac{n!}{r!(n-r)!}$ , where  $r \leq n$ ,  $n! = n \times (n-1) \times \dots \times 3 \times 2 \times 1$ , and  $0! = 1$ .

It is not until  $n = 23$ , that a value exceeds one-million:  $\binom{23}{10} = 1144066$ .

How many, not necessarily distinct, values of  $\binom{n}{r}$  for  $1 \leq n \leq 100$ , are greater than one-million?