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**Counting it up**

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In the game of poker a ‘hand’ of five cards is drawn from a ‘pack’ of 52 cards. How many different hands are possible?

This is an example of an important general problem. If we have some number,  $n$ , of cards, all different from each other (the pack) and a smaller number,  $k$ , drawn from these, in how many ways can this be done?

The answer, well known to mathematicians, is called  $\binom{n}{k}$  (or, in older texts,  ${}^nC_k$ ) and has as a formula:

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

The symbol “!” indicates the factorial:

$$x! = 1 \times 2 \times 3 \times 4 \times \cdots \times x$$

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**Task**

Write and test a computer program using 64-bit integers that displays the value of  $\binom{n}{k}$  for given  $n$  and  $k$ . Your program should not access any multiple precision features of your chosen language such as `BigInteger` in Java. Of course using `python` is right out!

(2 points, Pair)