Collaboration is encouraged. You may discuss the problems with other students, but you must write up your own solutions, including all your C programs, by yourself. If you submit identical or nearly identical solutions to someone else, this will be considered a violation of the code on academic honesty.

Assemble an Arduino circuit with two buttons, the LED, and the motor. The circuit should read three binary numbers, \( n \), \( k \) and \( a \) as follows.

- When the first button is pressed, the value of the bit depends on whether the second button is also pressed. If it is, the bit is 1; if it is not, the bit is 0. (Press and release the first button for each bit. Press and hold the second button before pressing the first button if you want a 1.)

- Read a total of 13 bits this way. Call the number represented by the first 3 bits \( n \); the next 3 bits \( k \); and the final 7 bits \( a \).

- The circuit should activate the motor if

\[
a = \binom{n}{k} = \frac{n!}{k!(n-k)!}.
\]

It should light up the red LED otherwise.