Binomial Algorithm

Objective:

Using biological data create an algorithm that will calculate the exact chances of a certain phenotype.

Complexity level:

* Medium

Scenario:

* John doe is a researcher at X university.
* The customer wants to streamline a way to calculate the chances of a certain phenotype affecting a specific percent of the population.

Problem statement

1. Write an algorithm to calculate the probability that in a population of 50,000 people, exactly 20,000 have Huntington’s disease (autosomal dominant).
2. Write an algorithm that calculates the probability that within those 50,000 20,000 people have both Huntington’s and cystic fibrosis (autosomal recessive).
3. Create a binomial calculator- which takes input from the user and calculates the probability *(a little tougher).*

Expectation outcomes:

Practice binomial calculation, which is very useful in the field of biology (genetics specifically), and get introduced to basic bioinformatics/statistics.

Reference URL:

1. Weisstein, Eric W. ["Binomial Theorem"](http://mathworld.wolfram.com/BinomialTheorem.html). Wolfram MathWorld.
2. Coolidge, J. L. (1949). ["The Story of the Binomial Theorem"](http://www.jstor.org/pss/2305028). The American Mathematical Monthly 56 (3): 147–157. [doi](https://en.wikipedia.org/wiki/Digital_object_identifier):[10.2307/2305028](https://dx.doi.org/10.2307%2F2305028).
3. Jean-Claude Martzloff; S.S. Wilson; J. Gernet; J. Dhombres (1987). A history of Chinese mathematics. Springer.
4. Landau, James A. (1999-05-08). ["Historia Matematica Mailing List Archive: Re: [HM] Pascal's Triangle"](http://archives.math.utk.edu/hypermail/historia/may99/0073.html) (mailing list email). Archives of Historia Matematica. Retrieved 2007-04-13.