The variance is the mean of the square minus the square of the mean.

For example, the mean of \((X_1 + X_2)^2\) comes to \(.98(0M)^2 + .02(100M)^2 = 200M^2\) or to \(.9801(0M)^2 + .0198(100M)^2 + .0001(200M)^2 = 202M^2\) in the lottery problem. Subtracting \(4M^2\) (the square of the mean) gives the results we obtained the hard way.

There's an even easier formula yet, if we want to calculate \(V(X + Y)\) when \(X\) and \(Y\) are independent: We have

\[
V(X + Y) = E((X + Y)^2) - (EX + EY)^2 = E(X^2) + 2(EX)(EY) + E(Y^2) - (EX)^2 - 2(EX)(EY) - (EY)^2 = VX + VY.
\]

The variance of a sum of independent random variables is the sum of their variances.