1. **Confidence intervals versus hypothesis tests**. Suppose we gather data from an unknown distribution which we can assume to be normal. If we have $n = 10\ 000$, $\bar{X} = 100$ and $s^2 = 4$, then

   (a) Find a 99% confidence interval for μ.

   (b) Find a 99% one-sided confidence interval for an upper bound for μ.

   For what values of μ_0 would we reject (at 99%) the null hypothesis $\mu = \mu_0$

   (c) with the alternate hypothesis $\mu \neq \mu_0$?

   (d) with the alternate hypothesis $\mu > \mu_0$?

   This provides another interpretation of confidence intervals.

   Here's a partial z-table for your use

α	0.050	0.025	0.020	0.010	0.005	0.001
z_α	1.645	1.960	2.054	2.326	2.576	3.090

2. **Understanding confidence intervals**. Suppose we're using a confidence interval to estimate a mean. What happens to the interval if

   (a) Our confidence level increases?

   (b) n increases, assuming everything else is constant?

   (c) s^2 increases, assuming everything else is constant?

   (d) $\bar{X}$ increases, assuming everything else is constant?

   (e) we scale all the data by a constant multiple?