Maternal smoking and infant health: Part I

The data available for this project are a subset of a much larger study — the Child Health and Development Studies. The women in the study were all those enrolled in the Kaiser Plan who had obtained prenatal care in the San Francisco–East Bay area and who delivered at any of the Kaiser hospitals in Northern California. At birth, measurements on the baby were recorded. Provided here is a subset of this information collected for 1236 babies — those baby boys born during one year of the study who lived at least 28 days and who were single births (i.e., not one of a twin or triplet). The information available for each baby is birth weight and whether or not the mother smoked during her pregnancy.

Variable	Description
Birth weight	Baby's weight at birth in ounces.
	(0.035 ounces = 1 gram)
Smoking status	Indicator for whether the mother smoked (1)
	or not (0) during her pregnancy.

- Summarize numerically the two distributions of birth weight for babies born to women who smoked during their pregnancy and for babies born to women who did not smoke during their pregnancy. Compare the means and sd of the two distributions as well as the quantiles of the distributions.

- Compare the distributions graphically. Consider density traces, quantile-quantile plots, and box plots. If you make separate plots for smokers and nonsmokers, be sure to scale the axes identically for both graphs.

- Compare the frequency, or incidence, of low-birth-weight babies for the two groups. A low-birth-weight baby is one who weighs under 2500 grams, or 5.5 pounds. How reliable do you think your estimates are? That is, how would the incidence of low birth weight change if a few more or fewer babies were classified as low birth weight?

- Compare the distributions to the normal via normal quantile plots and measures of skewness and kurtosis.

- Conduct one of the following simulation studies to assess the fit of the normal distribution to this data:

– Conduct a simulation study of the distribution of the sample kurtosis from a 484 observations from a normal distribution. Where does the observed kurtosis fit in relation to the simulated distribution?

– Construct a simulation study of the quantile plots to determine typical deviations form a line when the data are normal.