1. Mosquitofish (*Gambusia Affinis*) are commonly used in rice fields to control mosquito populations. With West Nile virus cropping up in California, mosquito problems are becoming (at least politically) more important than ever. Babies were introduced into rice fields at UC Davis in the early summer, and the populations were observed over time. We have data sets from a rice field at four different times, in the Excel workbook located at the usual [http://myweb.lmu.edu/bfitzpatrick/Math360.htm](http://myweb.lmu.edu/bfitzpatrick/Math360.htm) website. What can you say about the population as time progresses? Plot the mean and standard deviation as a function of time. Sketch histograms of the population at each time. Bonus credit for putting all four histograms on the same picture (with compatible x-axis bins).

2. Perform the following hypothesis tests.
   - \( (a) H_0 : \mu = 0. \quad \bar{X} = 10, S = 20, n = 9. \quad \text{Use } \alpha = 0.05. \)
   - \( (b) H_0 : \mu = 0. \quad \bar{X} = 10, S = 0.5, n = 9. \quad \text{Use } \alpha = 0.05. \)
   - \( (c) H_0 : \mu > 1200. \quad \bar{X} = 1150, S = 250, n = 110. \quad \text{Use } \alpha = 0.01. \)
   - \( (d) H_0 : \mu = 1200. \quad \bar{X} = 1150, S = 250, n = 110. \quad \text{Use } \alpha = 0.01 \)
   - \( (e) H_0 : \mu < 1200. \quad \bar{X} = 1150, S = 250, n = 110. \quad \text{Use } \alpha = 0.01. \)

3. Devise a hypothesis test for the Monty Hall paradox to test if the winning probability is \( \frac{1}{2} \) under the switching strategy. Repeat for the winning probability being \( \frac{2}{3} \) under switching. Collect data and state (and back up) your claim.

Email your excel sheet to yourself and to me [bfitzpatrick@lmu.edu](mailto:bfitzpatrick@lmu.edu) for grading. *DO NOT PRINT!* In the subject line of the email, put your name and “hw 04 excel”.