The data for this class can be downloaded at
http://seeds.okstate.edu/SeedsPPP/CN,1/GulfWheat/(CN,1)GulfWheatHistSim.xlsx

Pretend it is 2008.

You are an assistant financial analyst for a food company who purchases wheat and makes frozen
dough. You are charged with analyzing the feasibility of a new food processing plant. The
profitability of the plant depends largely on wheat prices and energy prices (measured by oil prices).
After working with mechanical engineers and operational managers, you have determined that the
projected profits (depending on wheat prices) are as follows.

Wheat Prices ($/bu)	Projected Annual Profits
$2.5 or less	$30 million
($2.5 , $3.5]	$28 million
($3.5 , $4.5]	$20 million
($4.5 , $6.5]	($5) million
greater than $6.5	($40) million

These profits assume the oil price is $30 per barrel or less. For every $10 rise in oil prices above $30
the profitability of the factory decreases by five million dollars.

You are asked to estimate the range of profits the company may experience based on historical
patterns of wheat and oil prices. You are also asked to provide one number, the expected or average
projected profits, given historical prices. Using the wheat data from the Gulf used in the previous
class and the new oil price data provided in today's class, create a histogram of projected profits.

AGAIN, YOUR OUTPUTS ARE THE FOLLOWING
- **THE EXPECTED OR AVERAGE PROFITS USING HISTORICAL
  SIMULATION—ONE NUMBER.**
- **HISTOGRAM OF PROJECTED PROFITS FROM HISTORICAL
  SIMULATION—A CLEAR AND THOROUGH BAR CHART.**

(A) Historical Simulation of Factory Profits
You should obtain this histogram using something called *historical simulation,* where you simulate the
profits the factory would have experienced in the past by looking at oil and wheat prices in each year
from 1974 to 2007 (the range of the wheat data), calculating the profits the company would have
earned in each of these years, and making a histogram of those simulated profits.

This might sound confusing. To help, here are the following steps you should use.
  (1) You already have wheat prices for December of 1974 through 2007.
  (2) Now use the oil data concomitant with the MONTH function, and Data-Filter or Data-Sort
      to also find oil prices in December of 1974 through 2007.
  (3) Put your filtered oil price data adjacent to your wheat price data. Now you know December
      oil and wheat prices every year from 1974 and 2007. Use the information provided above to
      calculate what the factory's profits would have been in each year. To help you see how you

might do this, I have already made a template for you in the sheet *Historical Simulation*, where wheat and oil prices are translated into profits using three steps. However, there is at least one error in the formulas in each step. Investigate the formulas carefully, inferring what they are trying to accomplish so that you can deduce where the errors are incorrect. Fix the errors, and you have your simulated profits.

(4) Use these simulated profits for your histogram, where intervals for simulated profits are on the x-axis and the percent of simulated profits residing in that interval on the y-axis.

(5) The expected profits can be calculated as the average simulated profit from 1974 through 2007. This should make sense to you. You calculated simulated profits if the factory had been operating in the past, and whatever the average simulated profits is, that is the average or expected profits if the factory operates in the future.