Homework 4
This is a large homework, counting 3 times as much as a small homework.
Due 5:00 PM on September 17, 2013.

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Instructions : Complete the homework in a Word document, typing your answer to each question and embedding your histogram into the Word file. Then save that file as a pdf (ask Google if you don't know how to). Upload this pdf file to your Google Drive (accessible via your gmail account), share that document with me by emailing me the link (bailey.norwood@gmail.com). Once you have shared the link and I can access that pdf file you have submitted your homework.

26 possible points

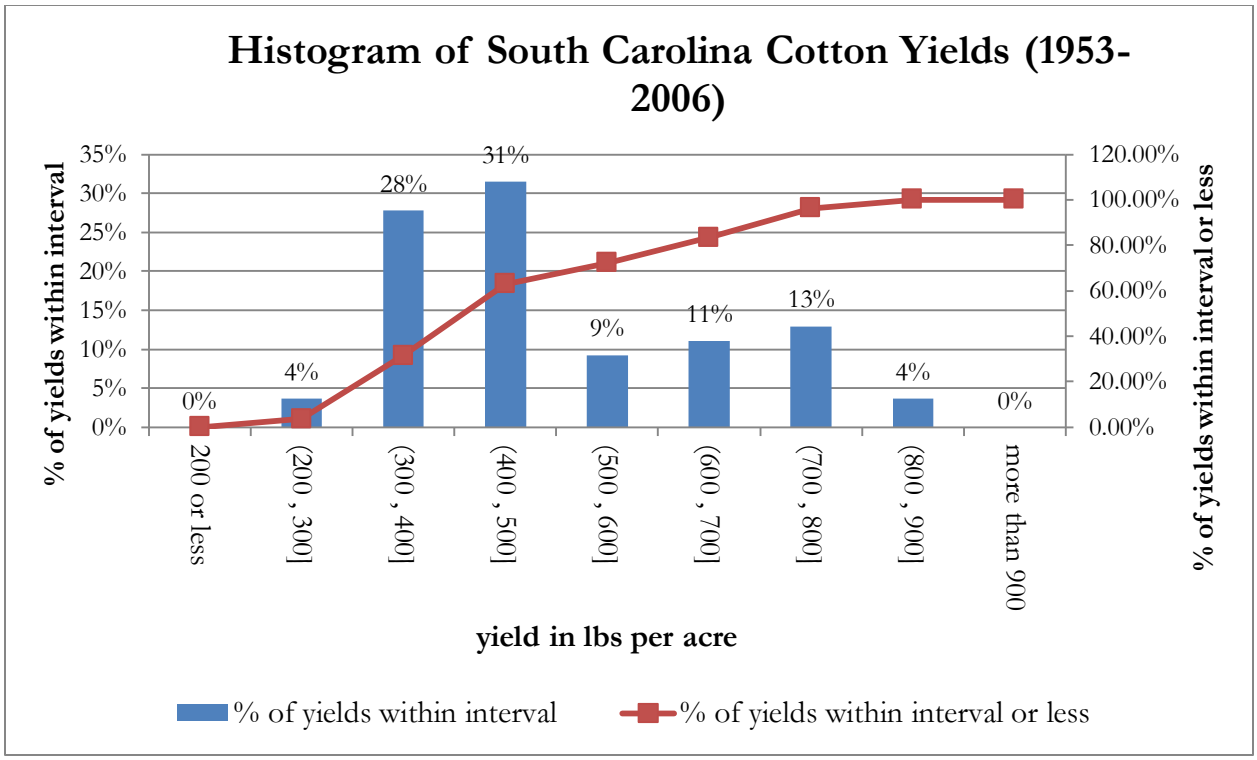
(A) Crop Insurance for Cotton in S.C.

(A1) [10 points] Download cotton yield data for S.C. between 1953 and 2006. Ignore the variable Time Trend. Create a clear and attractive histogram for the yields, following the directions given in *Video 3—How To Construct a Histogram.* Note that you must decide the appropriate bins to use. This histogram will be graded in considerable detail.

Took off points 1-3 points if the chart title did not include the type of crop, the region, and the years; if the legend and x / y axes did not say exactly what the numbers mean; if you misspelled words; if you have the wrong description of the data, like using word 'prices' instead of 'percent' or 'percent of farms' instead of 'percent of yield'.

Took off 5 points if your histogram numbers were wrong.

Took off 3 points if you used frequencies instead of percent for histogram or didn't use intervals for x-axis.



(A.2) [2 points] Suppose you work for an insurance company that sells policies which pay farmers $1,000 whenever yields are 400 lbs per acre or less. The yield is per acre, and the indemnity of $1,000 means the farmer will get $1,000 for every acre enrolled in the insurance policy. Based on your histogram, what is the breakeven premium for this policy?

Breakeven premium = (indemnity)(probability yield is 400 or less)=$(1,000)(0.3148) = $314.80 per acre

(A.3)) [2 points] If your company charges a premium 20% higher than the breakeven premium, what is the policy price?

314.80*1.2 = $377.76 per acre

(A.4)) [2 points] If you sell this policy at the price in (A.3) and next year's yield is 478, what are the per acre profits of this policy?

Premium - indemnity = $377.76 - $0 = $377.76

(A.5)) [2 points] If you sell this policy at the price in (A.3) and next year's yield is 325, what are the per acre profits of this policy?

Premium - indemnity = $377.76 - $1,000 = ($622.24)

(A.6)) [2 points] If you sell this policy at the price in (A.3), what is the expected profits of the policy when the policy is sold? That is, if this policy were sold thousands of times, what would the average profit per acre be?

Premium - expected indemnity = $377.76 - $314.80 = $62.96

(B) VaR Without Histograms

Download data on the simulated profits / losses for a company at here.

(B.1)) [4 points] There are 100 total simulated profits / losses, representing the possible profits the firm may experience and the probability of each possibility. I want you to calculate the VaR for this firm using a 7% threshold without using a histogram. Do this by first sorting the data in Excel (look under Data top at top then the Sort command underneath). Sort the profits / losses from the smallest to the largest number. Then, find the specific loss at which 7% of the simulations are less than or equal to this loss and 93% are greater. Whatever that specific loss is, that is the VaR.

VaR = ($2,217)

(B.2)) [2 points] Repeat (B.1), but now identify the VaR using a threshold of 12%.

VaR = ($1,056)