Assignment #3

(1) The "trick" to this question is to remember how to figure out the number of possibilities. With a bank of 12,000 possible compounds, the company can combine three (different) ones of these in any of

$$(12000)(11999)(11998)/(3)(2)(1) \approx 12000^3/6 = 288\ 10^9$$

ways. Our rough-and-ready Bonferroni approximation gives the approximate cut off for the t-statistic of

$$\text{Sqrt}(2 \log_e \#\text{possible}) = \text{Sqrt}(2 \log_e 288\ 10^9) \approx 7.26$$

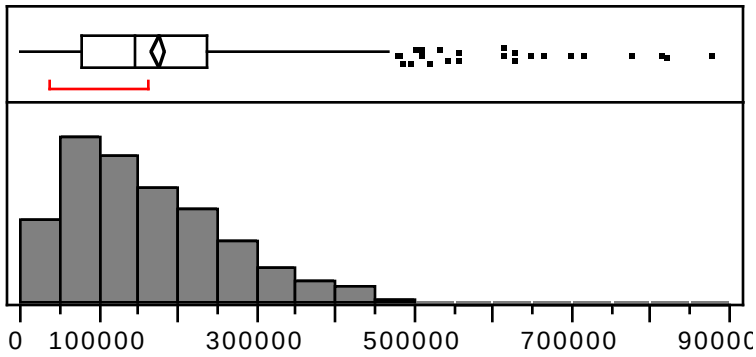
Even with so many possible effects, those that are very significant will shine through in the end. The p-value for this t-stat is quite small, on the order of about 10^{-13}. I prefer to use the t-value itself.

(2)

(a) Each sales representative generates about \$176,000 in sales/week, with an SD of \$125,000. To see how large the max could be, one way is to generate several samples with 1000 in each and look at what you get. With three samples I got values of \$540,000, \$559,000, and \$582,000. Alternatively use our rule for the Bonferrroni approximation; it gives with the mean added and scaled by the SD factor

$\$176{,}000+125{,}000\ \text{Sqrt}(2 \log_e 1000) \approx 176{,}000+125{,}000\ (3.717) \approx \$641{,}000$

(b) The observed maximum of \$877,412 looks impressive compared to the results in "a" and suggests that the award is appropriate.



(c) The data are very skewed, and the top seller is not so distinguished from some who are close by.

(d) So, is an award appropriate? Well, does this sales rep consistently do so well? How does this rep stack up against the others in the same dealership (which might be a very busy in general)?