Taking the SAT Multiple Times

The Chronicle of Higher Education (Jan. 29, 2003) published a summary of an article that appeared on The American Prospect website titled "College Try: Why Universities Should Stop Encouraging Applicants to Take the SAT’s Over and Over Again." In the paper, the authors argued against the current policy that takes the highest SAT score of an applicant. The author argues that this policy strongly favors students from higher incomes who can afford to take the SAT exam many times. In the paper, the author suggests two other methods that he believes would be fairer: to use only the most recent score, or to use the average (mean) of all the test scores.

It turns out that there is strong evidence that if a person takes the SAT multiple times, their scores will be normally distributed. Let us suppose for one example student, their “true score” is a 1800 for the three sections, but has a standard deviation of 29 points, due to variations in testing conditions, sleep patterns, etc.

Begin by considering what happens if this student takes the exam twice. You will use simulation to generate samples of two test scores, score 1 and score 2, for this student. Then you will compute the values of max, mean, and most recent for each pair of scores. (Most recent is just score 2) The resulting values of max, mean, and recent will be used to construct approximations to the sampling distributions of the three statistics.

1. The group should obtain 600 sets of two of "test scores" by generating observations from a normal distribution with mean 1800 and standard deviation 28. Put each sample into a list. (It will take the calculator about 2 minutes to generate each list)

2. Compute the maximum test score for each pair of scores and store the values in L3. (Highlight the name of the list, under LIST find MAX, and put MAX(L1,L2). This should put the higher of the two scores into L3.

3. Compute the average test score for each pair of scores and store the values in L4. (Do as above, except put MEAN instead of MAX)

4. Construct histograms for each of the three statistics lists, (recent, max, and mean) letting your calculator graph and then ZOOM STAT. Draw each histogram below. Label each axis with some numbers. Then fill in the requested information in a table for each distribution.

What do you notice about the three different distributions? Comment using the above information and histograms.

Now you will produce approximate sampling distributions for these same three statistics, but for the case of a student who takes the exam 5 times. Repeat the steps from above, but for five lists.

5. Construct histograms for each of the three statistics lists, (recent, max, and mean) letting your calculator graph and then ZOOM STAT. Draw each histogram below. Label each axis with some numbers. Then fill in the requested information in the table for each distribution.

What do you notice about the three different distributions above? Comment using the above information and histograms.

Based on the three distributions from part 1, for a two-time test taker, describe the advantage for the student of using the maximum score compared to using either the average score or the most recent score.

Now consider the approximate sampling distributions of the maximum score for two-time and for five-time test takers. How do these two distributions compare? Why do you think this happens?

Does a student who takes the exam five times have a big advantage over a student of equal ability who only takes the exam twice if the maximum score is used for college admission decisions? Explain using concepts we have discussed in class.

If you were writing admission procedures for a university, would you recommend using the maximum test score, the average test score, or the most recent test score in making admission decisions? Write a paragraph justifying your choice.