EzCoach Problem Roulette

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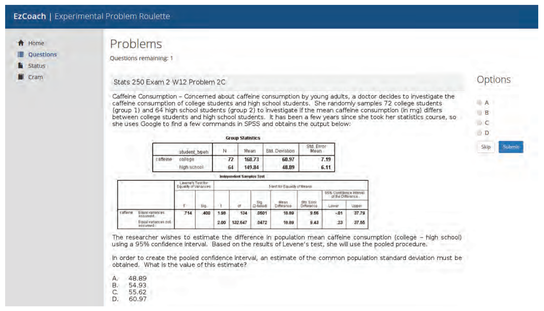
Overview

This Problem Roulette Add-On piloted in Stats 250 provides students the opportunity to create **teaching solutions** for selected questions in Problem Roulette. These solutions are voted on by participants in a tournament style peer review process. Students are able to see all solutions in ranked order for all problems during the review phase.

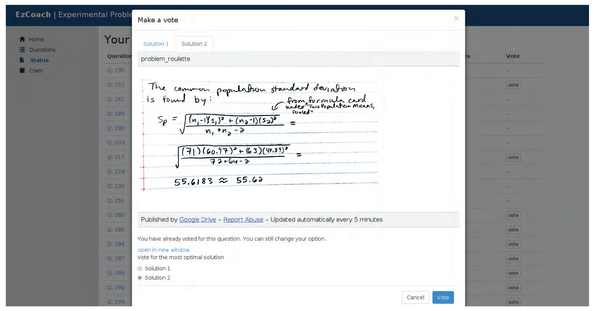
The Framework

1 Contribution



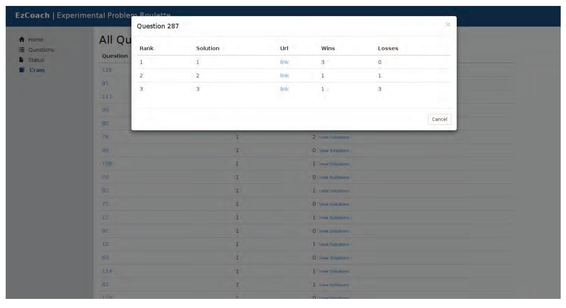
Students may provide solutions to correctly answered questions. These solutions are useful learning references for other students about how to solve the question. Solutions are accepted in Google Doc or Youtube Video format.

2 Peer Voting



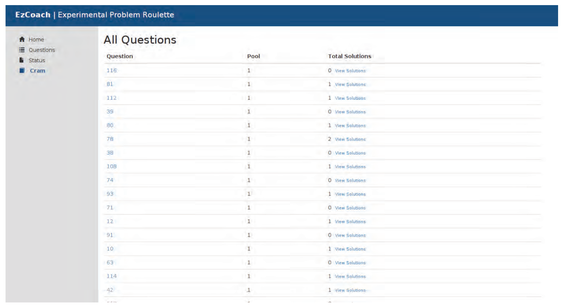
Students are shown 2 solutions and asked to pick the best. Choices are treated as binary preferences, and used later in ordering. An algorithm selects solutions for comparison which maximizes the information gain.

3 Ranking



Submitted solutions are ranked based on the binary preference data. This helps students pick out the best solutions to study. Students can track how their submitted solutions are being evaluated.

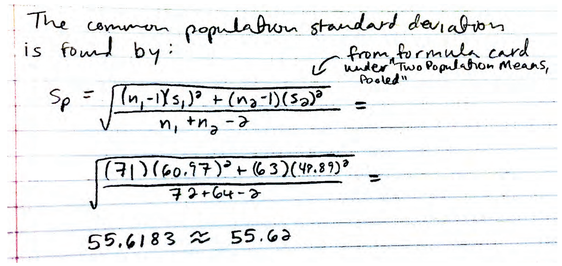
4 Review Phase



The final study period before the exam is the Review Phase. This interface shows all solutions to each question in ranked order. To encourage participation, students must pass a contribution threshold to gain access.

Voting Outcome

Solution 1



Solution 2

The estimate of the common population standard deviation can be calculated by the formula for finding Sp
Sp = sqroot[((72-1)*(60.97)^2)+((64-1)*(48.89)^2)]/[72+64-2]
Sp = 55.6184
So therefore estimate of the common population standard deviation is 55.62

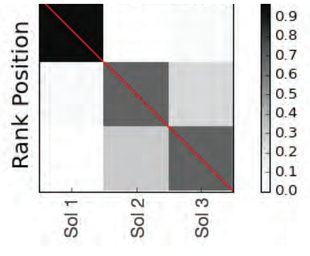
Solution 3

The question is asking for an estimate of the common population standard deviation, and we also know that we are going to be using pooled methods so if you visit the yellow card, under "Two Population Means" on page 2 you look under "Pooled" and find where it defines s_p and use that formula to find the answer.

$$s_p = \sqrt{\frac{(n1-1)(s1)^2 - (n2-1)(s2)^2}{n1+n2-2}}$$

Rank Probability

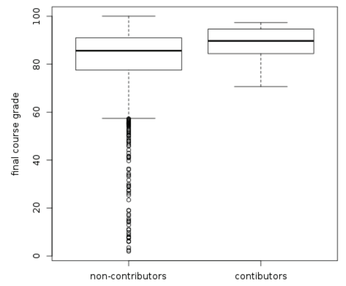
Rank probability is determined by iterative bootstrap resampling of the preferences submitted, ordering the bootstrap sample, and averaging over the rank position outcomes for each solution.



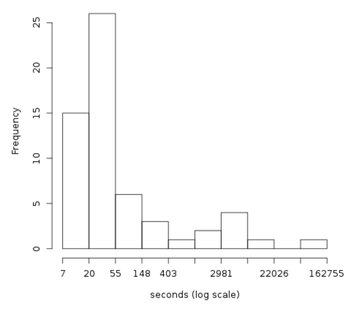
Findings

Selection Bias

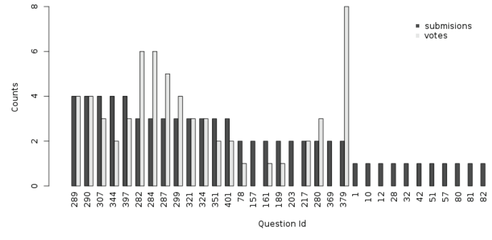
6.0 points @ 0.004 significance



Time Spent on Voting



Student Participation



Moving Forward

Explore incentive structures that increase participation. Enhance social learning with comments on solutions and requesting solutions to problems.