

TANKS PROJECT

Below is a worksheet for you to use in addressing the Tank Problem. The structure of the problem is that we are trying to determine the number of tanks N that are in the population. A random sample of K tanks will be taken without replacement. Based on the serial numbers X_1, X_2, \dots, X_K which are observed we are to come up with an estimate of the total number N of tanks in the population.

1. Before taking your sample, discuss in your group various ways you will be able to use the data you are going to gather to estimate the population size N . Write down at least five different estimators, and rank them 1 to 5, 1 being best, as to how good (accurate, etc.) each will be.
2. Take a sample of $K = 5$ cars, without replacement, from the bag of cars and record their serial numbers.
3. Before doing any calculations, record whether you have changed your mind as to the rankings of the estimators. If you think you have a different ranking, record the new ranking and why the change.
4. Calculate the estimate of N for each of your estimators.
5. Rank your estimators again. If there has been any change, record the new ranking and the reason for the change.