

## German Mark V Tank Problem

- Allied intelligence reports on German production of tanks and other war materials were somewhat unreliable during World War II.
- Statisticians set out to improve estimates of German tank production when it was discovered that German Mark V tanks were labeled with consecutive serial numbers.

1

## German Mark V Tank Problem

- Capturing a tank was like drawing a number from the sequence 1, 2, ..., N.
- The hope was to use the serial numbers of captured tanks to obtain a reliable estimate of N, the total number of Mark V tanks that had been produced by the Germans.

2

## German Mark V Tank Problem

It can be shown that one of the best estimators for N is

$$\hat{N} = \frac{n+1}{n} MAX - 1$$

where  $n$  is the size of the sample and  $MAX$  is the largest value in the sample.

3

## German Mark V Tank Problem

Month	Intelligence Agency Estimate	Serial Number Estimate	Actual Number of Tanks
June, 1940	1000	169	????
June, 1941	1550	244	????
Sept., 1942	1550	327	????

4

## German Mark V Tank Problem

Month	Intelligence Agency Estimate	Serial Number Estimate	Actual Number of Tanks
June, 1940	1000	169	122
June, 1941	1550	244	271
Sept., 1942	1550	327	342

5