Answer on question 36001 – Math – Statistic and Probability

I have a pool of 3000 people. I need 5% of that pool randomly selected in the result set.

If I run my code, assigning a random number then pulling the Top 5%.

I seem to get some of the same people in the result set each time I run my code.

What is the probability or odds of this happening?

Answer:

5% of your pool is 3000*0.05=150.

The number of ways to choose 150 peoples from 3000 without repetition is C_{3000}^{150}.

The number of ways to choose 150 peoples from 3000 in total is 3000^{150}.

The probability that you need can be founded by following formula

$$P = 1 - \frac{C_{3000}^{150}}{3000^{150}} \approx 1 - \frac{3000 * 2999 * \dots 2851}{150! \, 3000^{150}} \approx 1.$$

Answer: The probability that it had happened is close to 1.