How 63% data gets in bootstrapped sample

Let’s say we have n observations:  
  
Observation (O) = {*x1, x2 , x3, x4…. xk...... xn*}

Suppose we are creating a bootstrap sample of size n.   
Bootstrap sample (B) = { }   
Size = n.

In the first trial probability of each random element xk getting selected in B = 1/n  
  
In the first trial probability of xk not getting selected in B = 1-(1/n)

As all the draws in a bootstrap sample are independent of each other.

In all the n trials probability of xk not getting selected in B = (1-(1/n))n   
This is because all the draws in a bootstrap sample are independent events.

Now when n tends to infinity the expression will change as follows:

Limit *nLaTeX: \rightarrow∞* (1-(1/n))n = *(1/e)* ***≅*** *0.3678*

Hence the probability of a random element xk getting selected in n trials = 1-0.3678 = 0.6322

So the probability of a random element xk getting selected in n trials = 0.6322

**For example:**

Let’s say we have 100 observations in the data. The probability of a random observation not getting selected in a bootstrap sample of size 100 is:

(1 - 1 / 100)100  = (1 - 0.01)100 = (0.99100)100 = 0.366

Hence the probability of a random observations getting selected in a bootstrap sample of size 100, in 100 trials is = 1 - 0.366 = 0.634