

# The Riddler Classic - Marathon Problem

Jaewon Chung

May 24, 2018

**Problem (538 Link).** Given  $X_1, X_2, \dots, X_n \stackrel{i.i.d}{\sim} \mathcal{N}(\mu, \sigma^2)$ , estimate the number of  $n$  such that the probability of every pair of r.v.s is less than any  $s \geq 0$ , meaning  $|X_i - X_j| \leq s$  for all  $i \neq j$ , is 0.99.

**Solution** The problem can be restated as, given an

Below is from an numerical experiment that looks at different number of  $N$  runners and different values of  $s$ , which is denoted as  $\epsilon$ .

