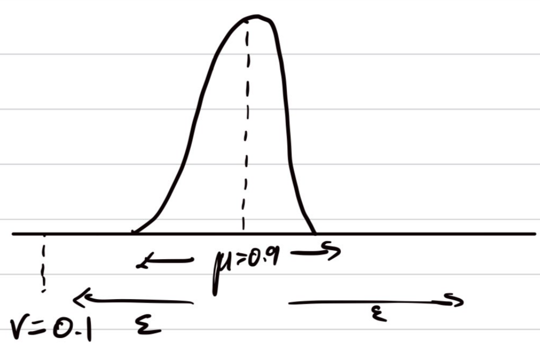
1. Exercise 1.8 in LFD

binomial distribution tells us

$$
\begin{aligned}
p_x &= \binom{n}{x} p^x q^{n-x} \\
n &= 10 \\
x &= 0 \text{ and } x = 1 \\
p &= 0.9 \\
q &= 1 - p = 0.1 \\
p_0 &= \binom{10}{0} 0.9^0 0.1^{10} = 0.1^{10} = 1 \times 10^{-10} \\
p_1 &= \binom{10}{1} 0.9^1 0.1^9 = 10 \times 0.9 \times 0.1^9 = 9 \times 10^{-9} \\
p &= p_0 + p_1 = 9.1 \times 10^{-9}
\end{aligned}
$$

2. Exercise 1.9 in LFD



we want 0.1 = V to happen, so ε = |0.9 − 0.1| = 0.8

Using $P[|\nu - \mu| \geq \epsilon] \leq 2e^{-2\epsilon^2 N}$, we can find the following bounds:
Using $\epsilon = 0.8$ and $N = 10$, we can derive $2e^{-2\epsilon^2 N} = 2e^{2(0.8)^2 \times 10}$, which equals 5.52×10^{-6}.
Since this is a bound, it is reasonable for it to be greater than our answer in exercise 1.8

3. Exercise 1.10 in LFD

   (a) $\mu = 0.5$

   (b) **FINISH HERE**

(c) **FINISH HERE**

(d) c_1 and c_{rand} obey the Hoeffding bound, c_{min} does not because $c1$ and c_{rand} were selected without looking at the data, while c_{min} looks at the data before selecting. c_{min} represents the "unlucky" choice

(e) **FINISH HERE**

4. Exercise 1.11 in LFD

   (a) **FINISH HERE**

   (b) **FINISH HERE**

   (c) **FINISH HERE**

   (d) **FINISH HERE**

5. Exercise 1.12 in LFD

   (a) **FINISH HERE**