

ECE 341 - Homework #4

Binomial and Uniform Distributions.

Note on Homework Solutions

Please include your Matlab code and/or hand calculations with all homework solutions. If you just submit your answers, I can't tell if you solve these problems or if you had ChatGPT solve them for you. (zero points on tests for using ChatGPT - not allowed)

Binomial Distribution

- 1) Poker: Odds of pair or high-card is $p=0.923745$. What are the odds of getting nothing better than a pair in 10 hands of poker?
- 2) Odds of a flush are $p=0.001965$. What are the odds of getting 3 or more flushes in 10 hands of poker?
- 3) Odds of a flush are $p=0.001965$. What are the odds of 5 flushes in 1024 hands of poker?

Mendel's Experiment

- 4) Mendel came up with the idea of dominant and recessive genes. If you cross two hybrid plants ($Gg \times Gg$)
 - 75% of the offspring should display the dominant trait (success: GG , Gg , or gG) while
 - 25% of the offspring should display the recessive trait (failure: gg).

Assume you run this experiment of crossing two hybrid plants, producing 40 offspring. What are the odds of getting *exactly* 30 offspring which display the dominant trait?

Uniform Distribution

- 5) Let player A roll ten dice:
 - $A = 3d6 + 3d8 + 4d12$

Determining the odds that

- $A = 60$
- $A > 60$

- 6) Let player B roll ten dice:
 - $B = 10d10$

Determine the odds that

- $B = 60$
- $B > 60$