CSE230 Spring 2022 Bonus Assignment

Recursion and Probability Distribution

April 29, 2022

1. Let, $a_1 = 3$ and for $n \geq 2, a_n = 2a_{n-1} + 5$, express a_n in terms of n.
2. Let, $a_1 = 3, a_2 = 4$ and for $n \geq 3, a_n = 2a_{n-1} + a_{n-2} + 5n$, express a_n in terms of n.
3. Let, $a_1 = 3, a_2 = 4$ and for $n \geq 3, a_n = 2a_{n-1} + a_{n-2} + n^2 - 1$, express a_n in terms of n.
4. Let, $a_1 = 1, a_2 = 2, b_1 = 0, b_2 = 1$,
$$\text{for } n \geq 3,$$
$$a_n = 2a_{n-1} + b_{n-1}$$
$$\text{for } n \geq 2$$
$$b_n = b_{n-1} + a_{n-1}$$
express a_n in terms of n.
5. Prove that the mean of Binomial Distribution is np and the variance is $np(1-p)$.