STA237 - Activity 1

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1. Let $n = 15$, and let Y be the number of right-handed people in $n = 15$ people. Then, $p = P(Y) = 0.9$. We have $Y \sim B(15, 0.9)$.

    (a) We want to find $E(Y)$ and $(V(Y)$.

    $$\mu = E(Y) = np$$
    $$= 15 \cdot 0.9$$
    $$= 13.5$$

    $$\sigma^2 = V(Y) = np(1-p)$$
    $$= 13.5 \cdot 0.1$$
    $$= 1.35$$
    $$\sigma = \sqrt{1.35} = 1.162$$

    (b) We want to find the probability at least one person not being right-handed, which is equivalent to $P(Y \leq 14)$. Using the binomial distribution table, we have:

    $$P(Y \leq 14) = 0.794$$

    (c) We want to find the probability of no more than 12 right-handed people, or $P(Y \leq 12)$. Using the binomial distribution table:

    $$P(Y \leq 12) = 0.184$$

    (d) We want to find $P(Y = 11)$. Using binomial distribution table:

    $$P(Y = 11) = P(Y \leq 11) - P(Y \leq 10)$$
    $$= 0.056 - 0.013$$
    $$= 0.043$$