STU22004 – Sample Questions 9

Q1. What is the variance of $2, 4, 6, \ldots, 2n$.

Q2. If $y = mx + \frac{3}{2}$ and $x = ky + 1$ are the regression lines, and $\bar{x} = \bar{y} = 2$, find $\rho_{X,Y}$.

Q3. John attends an exam with possible outcomes A, B or C with probabilities P_A, P_B and p_C, respectively. If he gets a B, he has to repeat the exam. What is the probability that exams finish with an A.

Q4. If $f(x) = 6(x - x^2)$, $0 \leq x \leq 1$, find $\hat{x}$.

Q5. If $X \sim U(-a, a)$ and $Y = X^2$, find $\rho_{X,Y}$.

Q6. In how many ways, can you put $2n$ similar chips in n different boxes to have at least 1 chip in each box?

Q7. For $X \sim f(x)$, if $Y = F(x)$, find $Var(X)$.

Q8. If X_1 and X_2 are iid with $f(x) = 2x$, $0 < x < 1$, find $P(X_1 < X_2 \mid X_1 < 2X_2)$.

Q9. If $f(x) = \frac{3x^2}{2}$, $-1 < x < 1$, and $Y = |X|$, find $f(y)$.

Q10. A box contains 5 red and 4 blue chips. If we take the chips one by one and without replacement, what is the probability that the 6th taken chip is red?

Q11. ...
to be continued