

KEN2130: Probability and Statistics

Homework Assignment 3 (graded)

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Logistics

We recommend that you write solutions in *R* markdown with RStudio; see Exercises 1 for instructions. For mathematical equations, you can use latex directly within *R* markdown. If you don't know latex, you can scan your handwritten solutions and include them as figures. The final submission should be one single pdf that you can upload to Canvas.

Question 1 (Median) [50 points]

In the last homework assignment, you calculated the expectation and the variance of the Beta distribution with parameters $a = 6$ and $b = 2$. This time around, find the median. Give a numerical solution without using `pbeta` and check graphically if your solution makes sense. Tip: Use `uniroot` in *R*.

Question 2 (Bean Machine) [50 points]

Answer the question in topic 8 on slide 14: Can you use the central limit theorem to explain why the histogram produced should look approximately Normal? Give a mathematical explanation and provide the parameters of the Normal distribution.