Some rules.

Generally, if you find that a stated problem is only solvable under additional hypotheses, state the hypotheses required, and if possible, give an counterexample to show that the additional hypotheses are indeed required.

In your writeup of solutions, any materials you quote verbatim should have quotation marks and a reference.

If you get help with a problem, you should acknowledge this in your writeup.

1. Consider the usual decision theory framework with $X \sim p(x, \theta)$ with parameter $\theta \in \Theta$. Suppose we estimate a parameter $\nu = \nu(\theta)$ using a loss function of the form

\[
l(\theta, a) = \begin{cases} 
A(\nu(\theta) - a) & \text{if } \nu(\theta) \geq a \\
B(a - \nu(\theta)) & \text{if } \nu(\theta) \leq a 
\end{cases}
\]

where $A$ and $B$ are positive constants. Find a simple description of form of the resulting Bayes rule in terms of the posterior distribution if $\theta$ given $X$.

The following sequence of problems deals with samples of random variables uniformly distributed in the interval $(0, 1)$. The results are important ones in multiple testing understanding false discovery rates.

2. Appendix Problem B.2.6

3. Appendix Problem B.2.7

4. Appendix Problem B.2.8

5. Appendix Problem B.2.9

6. Problem 1.1.9

7. Problem 1.2.6

8. Problem 1.2.14

9. Problem 1.2.15