HOMEWORK SET #12
Based on lectures 22 – 23

1. Let $X \sim \text{Binomial}(n, p)$.

   (a) If the prior $p \sim \text{Beta}(1/2, 1/2)$, find the Bayes factor for testing $\mathcal{H}_0 : p \in [0, 1/2]$ vs. $\mathcal{H}_1 : p \in (1/2, 1]$. Evaluate the Bayes factor and the p-value of the exact test for $n = 10$ and $x = 7$.

   (b) Modify the prior to test $\mathcal{H}_0 : p = 1/2$ vs. $\mathcal{H}_1 : p \neq 1/2$ and compute the Bayes factor? (Hint: Use $1/2$ for the point mass.) Evaluate the Bayes factor for $n = 10$ and $x = 7$.

   (c) Propose a p-value for testing $\mathcal{H}_0 : p = 1/2$ vs. $\mathcal{H}_1 : p \neq 1/2$ and evaluate it for $n = 10$ and $x = 7$.

2. From the book 8.10, 8.53, 8.54.