ENGINEERING PROBABILITY

HOMEWORK # 3:
Posted on 02/07/2018

Please work out the (10) problems stated below – BT refers to the text: D.P. Bertsekas and J.N. Tsitsiklis, Introduction to Probability (Second Edition), Athena Scientific (2008). Problem 1.55 (BT) refers to Problem 55 for Chapter 1 of BT (to be found at the end of Chapter 1). Answers to the problems in BT can be found at http://www.athenasc.com/probbook.html.

1. Consider a probability triple $(\Omega, \mathcal{F}, \mathbb{P})$. Let $A_1, A_2, \ldots, A_n$ be arbitrary events in $\mathcal{F}$. Show that the union bound
\[
\mathbb{P}\left[\bigcup_{i=1}^{n} A_i\right] \leq \sum_{i=1}^{n} \mathbb{P}[A_i]
\]
holds [HINT: By induction on $n = 2, 3, \ldots$].

2. Problem 1.14 (BT)

3. Problem 1.15 (BT)

4. Problem 1.16 (BT)

5. Problem 1.17 (BT)

6. Problem 1.51 (BT)

7. Problem 1.52 (BT). Describe the probability model.

8. Problem 1.54 (BT). Describe the probability model.
9. Problem 1.59 (BT)

10. Problem 1.60 (BT)