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

$$\mathbb{P}\left[\cup_{i=1}^{n} A_i\right] \leq \sum_{i=1}^{n} \mathbb{P}\left[A_i\right]$$

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)