

STA 131A – Homework 1

Submission due: Tue, April 7 at 11:59 PM PT

Instructor: Dogyoon Song

Instructions: Upload a single PDF file to Canvas (“Homework 1” under “Assignments”). Name the file using the prefix of your UC Davis email ID and the homework number (e.g., `dgsong_hw1.pdf`). Include “STA 131A,” your name, and the last four digits of your student ID on the front page. No late submissions will be accepted; any submission received after the deadline will receive 0 points. For full submission requirements and the late submission policy, see the syllabus.

Problem 1 (25 points in total).

(a) (7 points) [BT08, Problem 1, p. 53]

(b) (6 points) Prove De Morgan’s laws:

$$\left(\bigcup_n S_n\right)^c = \bigcap_n S_n^c, \quad \left(\bigcap_n S_n\right)^c = \bigcup_n S_n^c$$

(c) (6 points) [BT08, Problem 2-(a), p. 53]

(d) (6 points) [BT08, Problem 2-(b), p. 53]

Problem 2 (25 points in total).

(a) (5 points) [BT08, Problem 5, p. 54]

(b) (10 points) [BT08, Problem 6, p. 54]

(c) (10 points) [BT08, Problem 7, p. 54]

Problem 3 (25 points in total).

(a) (8 points) [BT08, Problem 9-(a), p. 54]

(b) (8 points) [BT08, Problem 9-(b), p. 54]

(c) (9 points) [BT08, Problem 10, p. 54]

Problem 4 (25 points in total).

(a) (10 points) [BT08, Problem 15, p. 56]

(b) (10 points) [BT08, Problem 16, p. 57]

(c) (5 points) [BT08, Problem 18, p. 57]

References

- [BT08] Dimitri Bertsekas and John N Tsitsiklis. *Introduction to probability*, volume 1. Athena Scientific, 2nd edition, 2008.