

## ASSIGNMENT 1

Due: 19 September, 11:59pm

Assignment 1 consists of the two parts (both are mandatory).

**Part I** (exercises in the textbook):

- **Chapter 1.1:** Exercise 4;
- **Chapter 1.2:** Exercise 1, Exercise 2, Exercise 4 (a)(b)(d);
- **Chapter 1.3:** Exercise 1, Exercise 3, Exercise 4, Exercise 6, Exercise 12, Exercise 13;
- **Chapter 1.4:** Exercise 2(a)(g)(k), Exercise 4(a), Exercise 9(a)(c);
- **Chapter 1.5:** Exercise 4(d)(e);
- **Chapter 1.6:** Exercise 4(a), Exercise 7.

**Part II:**

**Problem II.1.** Let  $X$  be a set and let  $\mathcal{A}$  be a collection of sets. Prove the following:

(1)

$$X - \bigcup_{A \in \mathcal{A}} A = \bigcap_{A \in \mathcal{A}} (X - A).$$

(2)

$$X - \bigcap_{A \in \mathcal{A}} A = \bigcup_{A \in \mathcal{A}} (X - A).$$

**Problem II.2.** Show that the supremum and infimum of a set are uniquely determined whenever they exist.