Supplement to Chapter 2 and 3 of Sutherland,

Introduction to Metric and Topological Spaces (Second Edition)

This document describes some differences between the set – theoretic notation in Sutherland and the corresponding notation for files in this directory.

Chapter 2

Relative complements (set – theoretic differences). Given two sets **B** and **A,** this set is defined on line 14 of page 5, and it is denoted by **B \ A.** We shall often use some alternate notation such as **B – A** or **B ⧹ A** or **B ¬ A.**

Chapter 3

Direct and inverse images. Given a function **f: X → Y** and subsets **A** and **C** of **X** and **Y** respectively, the direct image of **A** in **Y** and the inverse image of **C** in **X** are given by Definitions 3.1 and 3.2 on page 9. Sutherland denotes these subsets of **X** and **Y** by **f(A)** and $\mathbf{f^{-1}(C)}$, but to avoid possible confusion with the standard notation **f(x)** for the value of **f** at a point **x** in **X** we shall denote these subsets by **f[A]** and $\mathbf{f^{-1}[C]}$ respectively. This notational convention is taken from Kelley, ***General Topology*** (Reprint of the 1955 Edition; Springer – Verlag, New York, 1975).

Additional background material on set theory (*at the level of Mathematics* **144**)**:**

The following set of notes covers the material in the prerequisite course and also contains further information on several related topics**:**

http://math.ucr.edu/~res/math145A-2014/set-theory-notes.pdf

And here are exercises (with solutions) to accompany these notes**:**

http://math.ucr.edu/~res/math145A-2014/set-theory-exercises.pdf

http://math.ucr.edu/~res/math145A-2014/set-theory-solutions.pdf

Finally, a few supplementary topics are covered in the following file**:**

http://math.ucr.edu/~res/math145A-2014/set-theory-supplements.pdf