Math 587 – Assignment 1


1. Do Exercise E1.1 from the course text.

2. Do exercises 2.3,2.4,2.7,2.10 a) and c), and 2.16 from Billingsley (see link on web site). Note: Billingsley says \textit{field} instead of \textit{algebra}, \textit{\sigma}-field instead of \textit{\sigma}-algebra. Also, a \textit{class} of subsets of \( \Omega \) just means a subset of \( 2^\Omega \).

3. Optional: do 2.11 from Billingsley. This fact is related to the fact that we can not define a uniformly random element of a countable set.

4. The following exercises are from Tao’s Measure Theory book (the previous link is clickable).
   - Read definition of \( m^* \) on page 19, then Definition 1.2.2 on page 20.
   - Do exercises 1.2.7,1.2.16 (at least the equivalence of (i),(ii),(iii),(iv), the rest are optional), 1.2.17, 1.2.19.
   - Read Remark 1.2.17.
   - Do exercise 1.4.14, and optionally (but encouraged) 1.4.18 (a).
   - Read Definition 1.4.31, then do exercises 1.4.26 and 1.4.27.