MATH 154 - PROBABILITY THEORY, SPRING 2018
ASSIGNMENT 8

Due Wednesday, March 28 at the beginning of class. Make sure to include your full name *and the list of your collaborators* (if any) with your assignment. You may discuss problems with others, but you may *not* keep a written record of your discussions. Please refer to the syllabus for details.

With regards to answering these problems, imagine that you are writing an answer to teach someone else in the class how to do the problem. In particular, you must give a complete outline for how you arrived at your answer. It is not sufficient to simply state a number or formula without providing the steps and reasoning that you used to produce the answer.

(1) Do problem 4 on p. 107 of Grimmett-Stirzaker.
(2) Let $X_1, X_2, \ldots, X_n$ be independent and uniformly distributed in $[0, 1]$. Let $S_n = \sum_{i=1}^{n} X_i$, and let $x \in [0, 1]$. Prove that $P(S_n \leq x) = \frac{x^n}{n!}$. *Hint: proceed by induction on n. For the inductive step, condition on the value of X_n.*
(3) Do problem 3 on p. 112 of Grimmett-Stirzaker.
(4) Do problems 2, 5, and 6 on p. 155 of Grimmett-Stirzaker.

Date: March 21, 2018.