

MTH U581: Spring 2008: Prof. C. King

Assignment 2

Due date: Wednesday, January 23.

Reading: Sections 3.3 – 3.4.

Problems:

1. p. 161: #7, #8.
2. p. 186: #26.
3. A fair coin is tossed n times. Say a changeover occurs whenever an outcome differs from the one preceding it. (So for example there are 3 changeovers in sequence H H T H T). What is the probability that there are k changeovers in the n tosses?
4. A total of r keys are to be put, one at a time, into k boxes, with each key independently being put in box i with probability p_i . Assume that $\sum_{i=1}^k p_i = 1$. Each time a key is put in a nonempty box, we say that a collision occurs. Find the expected number of collisions.
5. A biased coin has probability p of landing Heads. The coin is tossed until Heads appears for the r^{th} time. Let N be the number of tosses required. Calculate $E[N]$. [Hint: write N as the sum of r random variables]