

# Probability and Computing, 2nd Edition

Solutions to Chapter 5: Balls, Bins, and Random Graphs

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## 5.1

As  $(1 + 1/n)^n$  increases, we find the smallest  $n$  to reach the threshold.  $(1 + 1/n)^n$  first reaches  $0.99e$  at  $n = 50$ , and  $0.999999e$  at  $n = 499982$ . Since  $(1 - 1/n)^n$  also increases, we solve in a similar way.  $(1 - 1/n)^n$  first reaches  $0.99/e$  at  $n = 51$  and  $0.999999/e$  at  $n = 499991$ .

## 5.2