STAT 321 Winter 2017

Quiz 3: Counting methods
(taken on Wed Jan 18)

You may work with in a group of as many as three students on this quiz, handing in one quiz with all names, provided that you all contribute to the work.

For questions 1–3, you will determine the probability that in a group of 5 people, at least two share the same birth month. Assume that all 12 months are equally likely to be someone’s birth month.

1. First determine the denominator: How many choices are there for the birth months of these 5 people (without any restrictions)?

2. Next determine the numerator for the complement: How many choices are there for the 5 people to have all different birth months?

3. Report the probability that in a group of 5 people, at least two share the same birth month. (Report your final answer as a decimal, as well as showing how you reached that answer.)

4. Is it reasonable to assume that the 12 months of the year are equally likely to be a person’s birth month? Explain briefly.

5. Suppose that a manager must choose 3 employees to be laid off from among the 12 employees that she supervises. Also suppose that 4 of these employees are over age 50, and 8 of these employees are age 50 or younger. If the decision about which employees to lay off is made completely without regard to age (i.e., at random with regard to age), what is the probability that all 3 of the employees selected would be over age 50? (Report the probability as a decimal as well as with combinations.)