Assignment 1 – Basic Probability, Computing and Statistics 2015

To be handed in at latest on Monday, September 7th

Exercises

1. If you flip a fair coin 6 times, what is the probability of getting exactly 4 tails?
2. There are 11 students in a class: 4 boys and 7 girls. If you pick a group of 5 at random, what is the probability that everyone in the group is a girl?
3. You have 6 friends, and want to pick and order 5 of them in a single line. In how many ways can you arrange them?
4. How many functions defined on n points are possible if each function can take a value from a set V?
5. Ten students are to be divided into two cohorts of 5 students each. How many different divisions are possible?
6. How many different signals, each consisting of 9 colored dots on a pole, can be made from a set of 4 orange dots, 3 purple dots, and 2 cyan dots if all poles of the same color are identical?
7. In how many unique ways can the letters of a word with n letters be arranged if it contains repetitions of one letter p times, and repetitions of another letter q times?
8. A program committee of 3 men and 3 women is to be formed from a group of 8 women and 6 men How many different committee are possible if 2 of the men refuse to serve together?
9. You have 3 books on complexity theory, 2 on probability theory, and 1 novel. In how many ways can these books be arranged on a bookshelf if the books on complexity theory must be together but the other books can be arranged in any order?
10. A restaurant is testing a new menu. They have prepared 3 tables with 2 distinct dishes for each table. If 3 sets of partners are to be assigned to these 6 dishes so that each partner tastes a different dish at the same table, how many assignments are possible?

* In how many unique ways can the letters in the word 'error' be arranged?

* Jouke is packing his bags to go on vacation. He has 6 unique shirts, but only 5 fit in his bag. How many different groups of shirts does he have to chose from?

* You got a free ticket for a guided bike tour to Bloemendal, and you can bring along 3 friends! Unfortunately, you have 7 who want to tag along on this exciting adventure. How many different groups of friends could you take with you?

* How many functions defined on n points are possible if each functional value is either 0 or 1?

* A programme committee of 3 is to be formed from a group of 20 reluctant researchers. How many different committees are possible?