Probability - part 6

date: . . . . . , class: . . . . . , student: . . . . . .

1 Exercises

- **Exercise 1:**[1] A committee of 5 *is to be chosen from a group* of 9 people. How many ways can it be chosen, if Bill and Karl must serve together or not at all?
- **Exercise 2:**[2] An *urn* contains 20 *marbles*: 5 red, 5 yellow, 5 green, and 5 white. You randomly extract 3 marbles from the urn without putting back in the urn the extracted balls. Calculate the probabilities of the following events:
  - exactly one of the extracted balls is red;
  - each of the three extracted balls has a different color.
- **Exercise 3:** You throw two dice. Consider the two events A = "the sum of the scores of the two dice is 8", and B = "the score of the first die is 3". Calculate the conditional probability of A given B. Are the two events independent? Motivate your answer.
- **Exercise 4:** You have one fair coin and two unfair coins: the first unfair coin lands on heads with a 60% chance, while the second unfair coin lands on tails with a 20% chance. You randomly choose one of these coins from a bag and flip it: what is the probability that it lands on heads?

2 Glossary

- is to be chosen from a group = deve essere selezionato all'interno di un gruppo
- urn = urna
- marble = biglia

[1] this exercise is taken from the "Harvard-MIT Mathematics Tournament" of 2004.

[2] this exercise is a translation of question number 3 of the Italian secondary school exit exam from 2014.