



Pick some of the exercises below for your tutorial.

Exercise 1 A manufacturer has offers from 7 small software houses for some particular software. The potential contract with the software houses also include maintenance and updates of the software. The manufacturer will pick two of the companies and start lengthy negotiations. However, not known to the manufacturer, 3 of the software houses will not be able to provide reliable service. What are the probabilities that (a) both selected software houses won't be able to provide reliable service; (b) one of the selected software houses won't be able to provide reliable service; (c) both selected software houses will be able to provide satisfactory service.

Exercise 2 Out of 110 students, 6 are randomly selected for an internship in a company. How many possible selections are there? If you are one of the students, what is the probability that you are selected?

Exercise 3 The pin-code of a debit card consist of 4 randomly selected digits. How many possibilities are there? If your card gets stolen, what is the probability that the thief gets access to your account by randomly selecting pin-codes? (Usually, debit-cards are deactivated after 3 attempts to use it with a wrong pin-code.)

Exercise 4 How many possibilities are there for British (car) licence plates?

Exercise 5 A poker game is played with a deck of 52 cards. It starts with each player being dealt 5 cards. What are the probabilities that (a) a player gets 4 aces; (b) a player gets a flush (for example, 3 aces and 2 queens); (c) a player gets a street (five consecutive cards of one of the four colors)?

Exercise 6 (The data below for the projected outcomes are taken A. L. Kinchen, Projected outcomes of exploration programs based on current program status and the impact of prospects under considerations. *J. Petroleum Technology* 38(4) (1986).) Consider the following analysis in oil explorations:

barrels	probability
dry hole: 0	60%
50000	10%
100000	15%
500000	10%
1000000	5%

- What is the probability that an oil well prospect will contain at most 100000 barrels of oil?
- What is the probability that an oil well prospect will strike oil?
- Suppose that the costs to set up an oil well prospect are \$ 500000, and that the profit per barrel oil is \$ 5. What gain or loss is there to be expected in each oil well prospect?

Exercise 7 Three engineers work in the quality control department of a manufacturing company and are there responsible for end control of monitors. Suppose that engineer E_1 checks about 30%, engineer E_2 about 40%, and engineer E_3 about 30% of the monitors. Also suppose that these engineers are known to make mistakes (letting a faulty monitor pass and being sold) with probabilities 3%, 1%, and 2% respectively. A customer complains that his new monitor isn't working properly. Which engineer is most likely to have passed this faulty monitor?

Exercise 8 Show that if event A is independent from event B , then B is independent from A .

Exercise 9 Find three examples in each engineering, building construction, information technology, management, and politics, where statistics is used in an essential way. Find three examples in modules you took where statistics or statistical data was used.

Exercise 10 Recapitulate some new terms of week 1, like sample, population, mean, median, mode, variance, standard deviation.

Exercise 11 Consider the data of marks on slide 1-15. Verify the values for mean, median, mode, variance, and standard deviation given on slide 1-16.

Discard the 6 outliers, and calculate again mean, median, mode, variance, and standard deviations for this data set.

Represent the data graphically in a frequency diagram, where you collect data in steps of 10.