

Mathematics homework #1

Homework consists of 8 exercises. Exercises are numbered and title with their topics are marked near the number. Hints are provided to make solution process easier.

Exercise statements use parameters a, b, c , etc. to make tasks distinct for different students. List of parameter values is present in table 1 in appendix A.

Solutions should be handwritten with rather thorough explanations regarding notation introduced by the student (i.e. what are the events A, B etc.) and chosen ways to solve the problems. Each solution should start with the exercise statement with the individual parameter values.

Solutions should be labeled with student name and the individual number (according to table 1 of the appendix A), group number and homework number.

The pictures of every solution should be taken and sent to lecturer's email Sergey.Garbar@novsu.ru, with subject including student's name with the individual number according to table 2 of the appendix A, group number and homework number.

Homework is recommended to be submitted before 20th of December 2021.

Exercise 1: Classical probability

A box contains marbles. There are a red marbles, b blue marbles, c green marbles, d yellow marbles and e white marbles. What is the probability that the randomly chosen marble is f ?

Exercise 2: Complement of the event

A box contains marbles. There are a red marbles, b blue marbles, c green marbles, d yellow marbles and e white marbles. What is the probability that the randomly chosen marble is **not** g ?

Hint: how is this a complement event? What formula should be used here?

Exercise 3: Compound events

A box contains marbles. There are a red marbles, b blue marbles, c green marbles, d yellow marbles and e white marbles. Two marbles are consequently taken out of box at random. What is the probability that the first marble is g **and** the second is f ?

Hint: what kind of the compound event is considered here? What rule for finding the probability should be used?

Exercise 4: Compound events

What is the probability that the card taken out of deck is h **or** i ?

Hint: what kind of the compound event is considered here? What rule for finding the probability should be used?

Exercise 5: Counting rules

A person has a scarfs, b hats and d jackets. How many ways to choose a scarf, a hat and a jacket does this person have?

Exercise 6: Counting rules

A student has c different notebooks and decided to give a of them to a friend. How many ways does he have to give away these notebooks?

Hint: is that a permutation or a combination? Why?

Exercise 7: Counting rules

A student has d different notebooks and a different subjects. How many ways does he have to assign a notebook to a subject?

Hint: is that a permutation or a combination? Why?

Exercise 8: Total probability law

There were b apples and c oranges in the first basket. There are d apples and e oranges in the second basket. One basket is chosen. Probability to choose the first basket is $1/a$. One fruit is taken out. What is the probability that this fruit is an apple?

Hint: what two steps can we split the experiment into? What are the probabilities of those steps?

Appendix A: individual parameter values

Table 1 — Parameter values for exercises

#	Student name	a	b	c	d	e	f	g	h	i	j
1	Абуелмагд Халед Аттиа Вахба Гад	2	5	13	10	12	red	green	red	a number	lowercase
2	Али Мустафа Гамал Ахмед	3	8	12	9	10	green	blue	black	a face card	uppercase
3		4	10	10	12	8	blue	white	spades	an ace	lower and uppercase
4	Аль Бевани Мохаммед Акрам Кака Ахмед	5	12	11	11	12	white	yellow	clubs	an even number	lowercase
5	Мосса Мохамед Халафаллах Махвуз	6	11	9	10	10	yellow	red	hearts	a face card or 10	uppercase
6	Мохамед Осама Сабер Хассан	2	4	15	9	8	red	green	diamonds	a number	lower and uppercase
7	Селим Мостафа Осман Ахмед	3	5	14	12	12	green	blue	red	a face card	lowercase
8	Мохамед Зияд Фагих Абделаиз	4	8	13	11	10	blue	white	black	an ace	uppercase
9	Саад Афаф Акмаль Морси	5	10	12	10	8	white	yellow	spades	an even number	lower and uppercase
10	Радния Марьям Рамин	6	12	10	9	12	yellow	red	clubs	a face card or 10	lowercase
11	Радния Амир Рамин	2	11	11	12	10	red	green	hearts	a number	uppercase
12	Шехата Мохамед Сами Заки	3	4	9	11	8	green	blue	diamonds	a face card	lower and uppercase
13	Шихата Ахмед Эльхилали Эльсаид Мохамед	4	5	15	10	12	blue	white	red	an ace	lowercase
14		5	8	14	9	10	white	yellow	black	an even number	uppercase
15		6	10	13	12	8	yellow	red	spades	a face card or 10	lower and uppercase
16		2	12	12	11	12	red	green	clubs	a number	lowercase

#	Student name	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
17		3	11	10	10	10	green	blue	hearts	a face card	uppercase
18		4	4	11	9	8	blue	white	diamonds	an ace	lower and uppercase
19		5	5	9	12	12	white	yellow	red	an even number	lowercase
20		6	8	15	11	10	yellow	red	black	a face card or 10	uppercase