FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG
FACHBEREICH WIRTSCHAFTS-
WISSENSCHAFTEN

Exam Statistics (87015), winter semester 2020/21

Dear student,

Please mark your answers to the single-choice questions on the answer sheet on the last page in the following way: ○⊗○
If you want to correct an answer, please completely color the **wrong** answer like: ○●⊗

Please fill in your details below:

Surname : ______________________________

Name : ______________________________

Matriculation number : ______________________________

Study program : ______________________________

Room, Seat : ______________________________

Examinor : Prof. Dovern

IMPORTANT: Also mark your matriculation number on the answer sheet !

The following information may be entered by the examinor only:

____

Grade:

____

Signature examinor:

Please read these instructions carefully:

- All pages **must** remain together!
- The exam consists of 30 **single-choice questions** in total, 5 of which are related to R.
- Use the answer sheet on the last page to fill in your final answers. **Entries in the question section are not graded.**
- Write your name and matriculation number clearly on the answer sheet and additionally mark your matriculation number with crosses.
- Please use a **dark ball pen** on the answer sheet!
- The exam duration is 90 minutes.
- **Additional material allowed:**
  - Non-programmable calculator
  - A handwritten cheat sheet (two-sided) in A4 format

Good luck!

Exercise 1: Single-choice questions

Do not forget to mark your answers on the answer sheet and also fill in your name and matriculation number on the answer sheet.

Note: Exercise 1 consists of 25 questions. You can reach 1 point per question. Each question has **only one correct answer**. Mark the correct answer with a cross **on the answer sheet**. There is **no deduction of points for wrong answers**.

1.1 What does the weak law of large numbers imply for a sequence of independent and identically distributed random variables?

A The distribution of all sample moments converges to a standard normal distribution.
B Empirical and theoretical distribution functions converge.
C Sample mean and sample median converge.
D The variance of the sample mean, $\bar{x}$, converges to 0.
E The sample variance converges to 0.

1.2 Assume you have an identically and independently distributed random sample of size $n = 30$ from a normal distribution and you estimate a confidence interval with a confidence level of $1-\alpha$ for the population mean. Initially, you can assume that you know the population variance. Which of the following changes does **not** make the confidence interval wider?

A The population variance increases.
B α decreases
C You lose knowledge about the population variance and have to estimate it from the data.
D The sample size increases to 60
E All changes mentioned in the other options increase the width of the confidence interval.

1.3 F is the cumulative distribution function of a random variable X. f is the corresponding probability density function. Which of the following statements is correct for any such distribution?

A $F(x_{0.30}) < 0.3$
B $F(x) \leq f(x)$
C $F(x) \geq F(x')$ for $x \leq x'$
D $P(a < X \leq b) = F(a) - F(b)$
E $0 \leq F(x) \leq 1$

Consider the problem of constructing a decision tree. The application is for a data set with output variable Y and three features X_1, X_2, and X_3. There are ten observations available as a training sample (listed below).

i	y_i	$x_{1,i}$	$x_{2,i}$	$x_{3,i}$
1	1	red	A	1
2	1	red	B	2
3	0	green	A	1
4	1	red	A	1
5	1	green	B	2
6	0	green	B	2
7	0	green	A	1
8	0	green	B	2
9	0	red	A	1
10	0	green	B	2

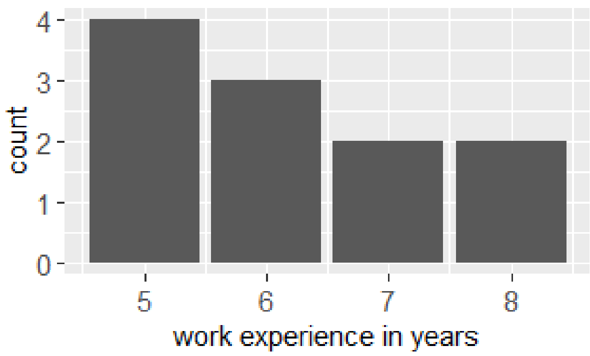
1.4 Which of the features yields the largest entropy gain (EG) if used to construct the sample split at the root node of the decision tree?

A Feature X_1
B The provided information is not sufficient to answer this question.
C $EG(X_1) = EG(X_2) > EG(X_3)$
D Feature X_2
E Feature X_3

1.5 You have a data set with information about 150 features for $n = 25,000$ smartphone users and want to group them into homogenous subgroups. Which of the following methods is the most suitable for this task?

A Pearson's correlation coefficient
B Regression tree
C Decision tree
D Reinforcement learning
E K-means-clustering

The random variable X is the work experience of employees (in years). The following graph shows the distribution of X for the eleven members of a particular team:



1.6 What is the mode of this distribution?
A 7
B 5
C 6
D 8
E 4

1.7 An English-language computer keyboard consists of 26 letters + 40 symbols + 10 numbers = 76 signs (assuming that no capital letters are used). How many possibilities exist to create a password that consist of **three different** signs?
A 438,976
B 70,300
C 421,800
D 180,120
E 228

Suppose the police conducts a general traffic control. Every driver on a particular street is tested for their blood alcohol. Consider the following events:

T: "The test returns a positive indication for alcohol consumption"
A: "The driver consumed alcohol before driving"

The police knows the following characterisics of the alcohol test:
$P(T \mid A) = 98\%$
$P(\overline{T} \mid \overline{A}) = 96\%$

It is also known that the unconditional probability of a positive test result is 4.28%.

1.8 Which of the answers is correct?

$P(T|A)$ and $P(\overline{T} \mid \overline{A})$
describe the probability of...
A a positive and negative test result.
B a true negative and false negative test result.
C a false negative and true positive test result.
D a true positive and true negative test result.
E a false positive and false negative test result.

1.9 Suppose that the police also knows that 0.3% of all drivers consume alcohol before driving. What is the probability that a driver with a positive test result consumed alcohol before driving?

A $P(A, T) = 0.6869$
B $P(A, T) = 0.0728$
C $P(A|T) = 0.0687$
D $P(T, A) = 0.0687$
E $P(A|T) = 0.6869$

1.10 Assign a measurement scale to the following three variables:
1. number of participants at an online conference
2. video quality (high, medium, low)
3. conference duration

A 1. nominal scale, 2. absolute scale, 3. ratio scale
B 1. interval scale, 2. ordinal scale, 3. absolute scale
C 1. absolute scale, 2. ordinal scale, 3. ratio scale
D 1. absolute scale, 2. nominal scale, 3. interval scale
E 1. ratio scale, 2. interval scale, 3. ratio scale

1.11 What is generally true when two events, A and B, are statistically independent?

A $P(A \cap B) = P(A, B) / P(B)$
B $P(A, B) = P(A) / (1 - P(B))$
C $P(A|B) = P(A)P(B)$
D $P(A|B) = P(B|A)$
E $P(A \cap B) = P(A)P(B)$

1.12 $X_1, \ldots, X_n$ are independently and identically normal distributed random variables with expected value μ and variance σ^2. What are the correct expressions for the expected value and the variance of the sample mean, $\bar{X}_n = \frac{1}{n}\sum_{i=1}^{n} X_i$?

A $E(\bar{X}_n) = n\mu$ und $V(\bar{X}_n) = \frac{1}{n}\sigma^2$
B $E(\bar{X}_n) = \frac{1}{n}\mu$ und $V(\bar{X}_n) = \frac{1}{n^2}\sigma^2$
C $E(\bar{X}_n) = \frac{1}{n}\mu$ und $V(\bar{X}_n) = \frac{1}{n}\sigma^2$
D $E(\bar{X}_n) = \mu$ und $V(\bar{X}_n) = \frac{1}{n^2}\sigma^2$
E $E(\bar{X}_n) = \mu$ und $V(\bar{X}_n) = \frac{1}{n}\sigma^2$

In a random survey with $n = 200$ participants, the participants were asked to name their favorite social network. It is also known that 80 participants are 30 years or older.

	Facebook (F)	Youtube (Y)	Instagram (I)
under 30 (U)	12	?	63
30 or older (O)	34	28	18

1.13 What is the share of participants that are under 30 years old and state that Youtube is their favorite social network?

A $h(Y|U) = 0.375$
B $h(Y, U) = 0.225$
C $h(Y|U) = 0.140$
D $h(U|Y) = 0.616$
E $h(U, Y) = 0.450$

1.14 What is the share of participants that state that Instagram is their favorite social network among those who are 30 years or older?

A $h(I,O) = 0.180$
B $h(O|I) = 0.228$
C $h(I|O) = 0.225$
D $h(I, O) = 0.090$
E $h(I|O) = 0.405$

The random variable Z describes the number of computers available in 10 randomly selected households in Europe:

i	1	2	3	4	5	6	7	8	9	10
z_i	0	0	0	0	1	2	2	2	2	5

1.15 What is the span of the observed data?

A 1.7
B 9
C 10
D 4
E 5

1.16 What is the interquartile range of the observed data?

A 2
B 3
C 1
D 1.4
E 1.5

The random variable X with unknown expected value μ and unknown variance σ describes the monthly rental expenses in Euro of students in Nuremberg.

You ask 200 randomly selected students about their monthly rental expenditures and find that the participants spend on average $\bar{x} = 380$ on rent with a sample standard deviation of s = 60.

1.17 A friend of yours claims that μ is 400 Euros. You doubt this claim and want to test it at a significance level of $\alpha = 5\%$ against a two-sided alternative.

What is the correct definition of the null hypothesis and the alternative hypothesis that you would set up in this situation?

A $H_0: \mu \leq 400, H_1: \mu > 400$
B $H_0: \mu = 400, H_1: \mu \neq 400$
C $H_0: \mu \geq 400, H_1: \mu < 400$
D $H_0: \mu = 400, H_1: \mu < 400$
E $H_0: \mu \neq 400, H_1: \mu = 400$

1.18 What is the realized test statistic T and how is T distributed?

A $T = 66.667$ and $T \overset{H_0}{\sim} t_{199}$

B $T = 4.714$ and $T \overset{H_0}{\sim} t_{200}$

C $T = -4.714$ and $T \overset{H_0}{\sim} t_{199}$

D $T = 4.714$ and $T \overset{H_0}{\sim} t_{199}$

E $T = -4.714$ and $T \overset{H_0}{\sim} t_{200}$

The random variable R: "Daily returns of an investment in Euro" is normal distributed with a mean of 0 and a variance of 144, i.e. $R \sim N(0, 144)$.

1.19 What is the return that the investor can expect to exceed on a random day with a probability of 35%?

A 0.39 Euro
B 0.00 Euro
C 4.62 Euro
D 8.91 Euro
E 55.48 Euro

1.20 What is the probability that the daily return of the investment is above 30 Euros on a random day?

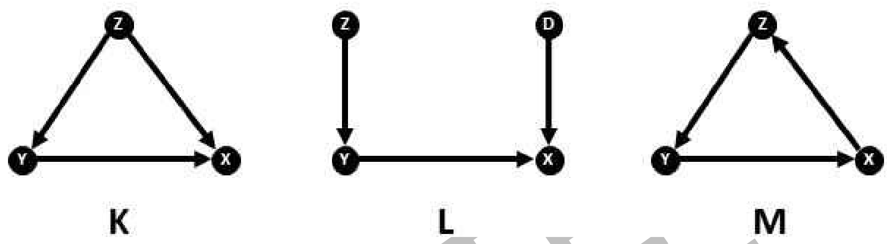
A 25.33%
B 2.50%
C 99.38 %
D 40.13%
E 0.62%

Consider the results of a math competition at a highschool of the following five pupils:

i	1	2	3	4	5
Rank	1	3	4	5	2
Age	14	13	10	9	12

1.21 Calculate the correlation between the achieved rank and the age with the appropriate measure.
A -0.67
B -0.99
C -0.90
D -0.43
E -0.50

Consider the following graphs:



1.22 Which of the three graphs (K - M) show proper directed acyclic graphs (DAGs)?
A Only L
B Only M
C K and L, but not M
D Only K
E K and M, but not L

The random variable X: "Waiting time in days for the result of a Corona test" is Poisson distributed with the parameter $\lambda = 2$.

The related probability mass function is:

$$f(x) = \begin{cases} e^{-\lambda} \dfrac{\lambda^x}{x!} & \text{for} \quad x = 0, 1, 2, 3, 4, ... \\ 0 & \text{otherwise} \end{cases}$$

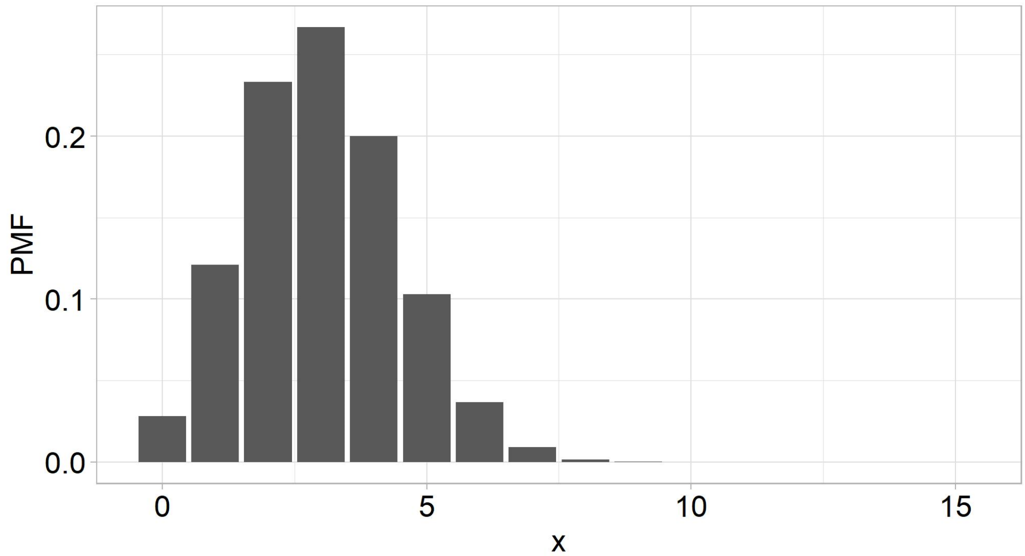
1.23 What is the probability that a person receives their test result on the same day as the test day?
A 0%
B 27.07%
C 7.39%
D 13.53%
E 40.60%

The amount of muesli in a box is normal distributed with a mean of 500g and a standard deviation of 50g. Quality control in the muesli plant randomly selects 16 muesli boxes from the production line.

1.24 Calculate the standard deviation of the sample mean.

A 12.5g
B 1.768g
C 156.25g
D 3.125g
E 50g

Look at the following probability mass function (PMF) of a binomial distribution with parameters n and p.



1.25 Which values for the two parameters are consistent with the shown PMF?

A $n = 15$, $p = 0.5$
B $n = 10$, $p = 0.3$
C $n = 15$, $p = 0.8$
D $n = 5$, $p = 0.5$
E $n = 10$, $p = 0.8$

Do not forget to mark your answers on the answer sheet and also fill in your name and matriculation number on the answer sheet.

Exercise 2: Single-choice questions about R

Do not forget to mark your answers on the answer sheet and also fill in your name and matriculation number on the answer sheet.

Note: Exercise 2 consists of 5 questions. You can reach 1 point per question. Each question has **only one correct answer**. Mark the correct answer with a cross **on the answer sheet**. There is **no deduction of points for wrong answers**.

2.1 The random variable X counts how often a 6 turns up when a fair dice is tossed three times. X follows a binomial distribution with $p = \frac{1}{6}$. Which of the following commands does **not** return the probability of tossing a 6 two or more times, $P(X \geq 2)$?

A pbinom(q = 1, size = 3, prob = 5/6)
B dbinom(x = 2, size = 3, prob = 1/6) + dbinom(x = 3, size = 3, prob = 1/6)
C 1 - pbinom(q = 1, size = 3, prob = 1/6)
D 1 - dbinom(x = 0, size = 3, prob = 1/6) - dbinom(x = 1, size = 3, prob = 1/6)
E 1 - pbinom(q = 1, size = 3, prob = 5/6)

Assume a work space in R Studio for the following questions. You have a dataframe called df in your environment. The dataframe df contains information from $n = 146$ countries and consists of the following variables:

Row 1: Name of the country (country)

Row 2: Per capita meat consumption in kg (pcmc)

Row 3: The per capita income in US dollars (pci)

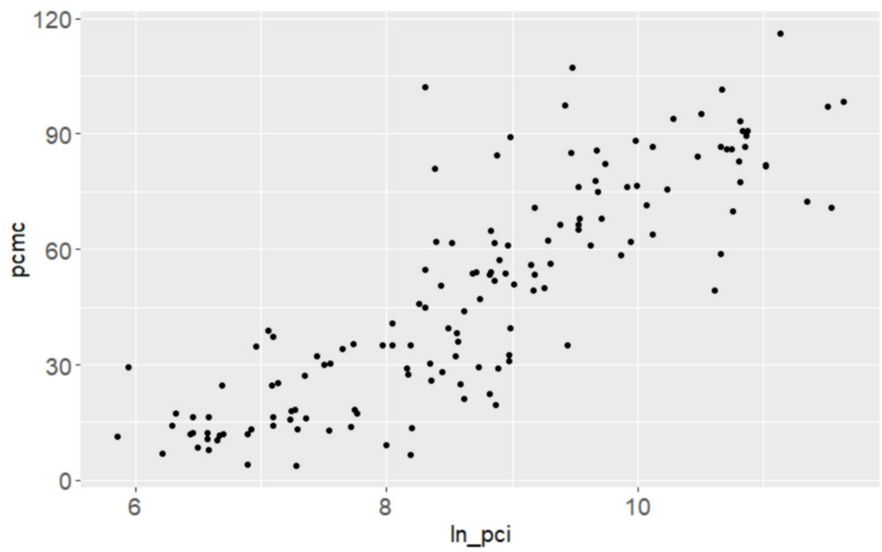
Row 4: The natural logarithm of per capita income (ln_pci)

Row 5: An indicator variable that takes the value 1 for countries with above-average meat consumption (pcmc_high)

Row 6: An indicator variable that takes the value 1 for countries with above-average per capita income (pci_high)

Apart from the dataframe df, the environment contains no other objects. The dataframe contains no missing values (NAs). The *tidyverse* package is activated. Your analysis resulted in the following outputs:

```
            df$pci_high
df$pcmc_high   0   1 Sum
         0    73   0  73
         1    34  39  73
         Sum 107  39 146
```



2.2 Look at the scatter plot of the logarithm of the per capita income and the per capita meat consumption. Complete the command to create this plot.

ggplot(data = **T**, aes(x = **U**, y = **V**)) + geom_**W**()

A **T**: df, **U**: ln_pci, **V**: pci, **W**: bar
B **T**: df, **U**: pci, **V**: pcmc, **W**: point
C **T**: df, **U**: ln_pci, **V**: pcmc, **W**: point
D **T**: dataframe, **U**: ln_pci, **V**: pcmc, **W**: scatter
E **T**: df, **U**: pcmc, **V**: ln_pci, **W**: bar

2.3 Look at the contigency table above. Which of the following statements is **not** true?
A More than 50% of the countries in the dataframe have above average per capita income.
B In most low-income countries the meat consumption is below average.
C The correlation between pcmc_high and pci_high is positive.
D There is no high-income country where the meat consumption is below the average.
E In exactly 50% of the countries the meat consumption is above average.

2.4 Consider the following sequence of commands:

```
df %>%
  filter(pcmc > 60) %>%
  summarize(mean(pci))
```

What is the ouput of this command?

A The per capita meat consumption of countries with above-average per capita income.
B The mean per capita income of countries with per capita meat consumption above 60kg.
C The median per capita income of countries with meat consumption less than 60kg.
D The countries with a per capita meat consumption above 60 kg.
E The mean meat consumption of countries with meat consumption above 60kg.

2.5 Which command produces a table with the relative frequencies of the variable pcmc_high?
A table(df$pcmc_high)
B table(df$pcmc_high) %>% length(df$pci_high)
C table(df$pcmc_high)/table(df$pcmc_high)
D table(df$pcmc_high)/length(df$pcmc_high)
E table(df$pcmc_high)/sum(df$pci_high)

Do not forget to mark your answers on the answer sheet and also fill in your name and matriculation number on the answer sheet.

Distribution Tables

Poisson Distribution - Probability Mass Function

x	λ									
	.005	.010	.020	.030	.040	.050	.060	.070	.080	.090
0	.9950	.9900	.9802	.9704	.9608	.9512	.9418	.9324	.9231	.9139
1	.0050	.0099	.0196	.0291	.0384	.0476	.0565	.0653	.0738	.0823
2	0.	0.	.0002	.0004	.0008	.0012	.0017	.0023	.0030	.0037
3	0.	0.	0.	0.	0.	0.	0.	.0001	.0001	.0001

x	λ									
	.100	.200	.300	.400	.500	.600	.700	.800	.900	1.00
0	.9048	.8187	.7408	.6703	.6065	.5488	.4966	.4493	.4066	.3679
1	.0905	.1637	.2222	.2681	.3033	.3293	.3476	.3595	.3659	.3679
2	.0045	.0164	.0333	.0536	.0758	.0988	.1217	.1438	.1647	.1839
3	.0002	.0011	.0033	.0072	.0126	.0198	.0284	.0383	.0494	.0613
4	0.	.0001	.0003	.0007	.0016	.0030	.0050	.0077	.0111	.0153
5	0.	0.	0.	.0001	.0002	.0004	.0007	.0012	.0020	.0031
6	0.	0.	0.	0.	0.	0.	.0001	.0002	.0003	.0005
7	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0001

x	λ									
	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	8.00	10.0
0	.2231	.1353	.0821	.0498	.0302	.0183	.0067	.0025	.0003	0.
1	.3347	.2707	.2052	.1494	.1057	.0733	.0337	.0149	.0027	.0005
2	.2510	.2707	.2565	.2240	.1850	.1465	.0842	.0446	.0107	.0023
3	.1255	.1804	.2138	.2240	.2158	.1954	.1404	.0892	.0286	.0076
4	.0471	.0902	.1336	.1680	.1888	.1954	.1755	.1339	.0573	.0189
5	.0141	.0361	.0668	.1008	.1322	.1563	.1755	.1606	.0916	.0378
6	.0035	.0120	.0278	.0504	.0771	.1042	.1462	.1606	.1221	.0631
7	.0008	.0034	.0099	.0216	.0385	.0595	.1044	.1377	.1396	.0901
8	.0001	.0009	.0031	.0081	.0169	.0298	.0653	.1033	.1396	.1126
9	0.	.0002	.0009	.0027	.0066	.0132	.0363	.0688	.1241	.1251
10	0.	0.	.0002	.0008	.0023	.0053	.0181	.0413	.0993	.1251
11	0.	0.	0.	.0002	.0007	.0019	.0082	.0225	.0722	.1137
12	0.	0.	0.	.0001	.0002	.0006	.0034	.0113	.0481	.0948
13	0.	0.	0.	0.	.0001	.0002	.0013	.0052	.0296	.0729
14	0.	0.	0.	0.	0.	.0001	.0005	.0022	.0169	.0521
15	0.	0.	0.	0.	0.	0.	.0002	.0009	.0090	.0347
16	0.	0.	0.	0.	0.	0.	0.	.0003	.0045	.0217
17	0.	0.	0.	0.	0.	0.	0.	.0001	.0021	.0128
18	0.	0.	0.	0.	0.	0.	0.	0.	.0009	.0071
19	0.	0.	0.	0.	0.	0.	0.	0.	.0004	.0037
20	0.	0.	0.	0.	0.	0.	0.	0.	.0002	.0019
21	0.	0.	0.	0.	0.	0.	0.	0.	.0001	.0009
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0004
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0002
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0001

Standard Normal Distribution - Cumulative Distribution Function

z	0	1	2	3	4	5	6	7	8	9
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998
3.5	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998
3.6	.9998	.9998	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
3.7	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
3.8	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
3.9	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

Standard Normal Distribution - p-Quantiles

p	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
50	0.0000	.0025	.0050	.0075	.0100	.0125	.0150	.0175	.0201	.0226
51	.0251	.0276	.0301	.0326	.0351	.0376	.0401	.0426	.0451	.0476
52	.0502	.0527	.0552	.0577	.0602	.0627	.0652	.0677	.0702	.0728
53	.0753	.0778	.0803	.0828	.0853	.0878	.0904	.0929	.0954	.0979
54	.1004	.1030	.1055	.1080	.1105	.1130	.1156	.1181	.1206	.1231
55	.1257	.1282	.1307	.1332	.1358	.1383	.1408	.1434	.1459	.1484
56	.1510	.1535	.1560	.1586	.1611	.1637	.1662	.1687	.1713	.1738
57	.1764	.1789	.1815	.1840	.1866	.1891	.1917	.1942	.1968	.1993
58	.2019	.2045	.2070	.2096	.2121	.2147	.2173	.2198	.2224	.2250
59	.2275	.2301	.2327	.2353	.2378	.2404	.2430	.2456	.2482	.2508
60	.2533	.2559	.2585	.2611	.2637	.2663	.2689	.2715	.2741	.2767
61	.2793	.2819	.2845	.2871	.2898	.2924	.2950	.2976	.3002	.3029
62	.3055	.3081	.3107	.3134	.3160	.3186	.3213	.3239	.3266	.3292
63	.3319	.3345	.3372	.3398	.3425	.3451	.3478	.3505	.3531	.3558
64	.3585	.3611	.3638	.3665	.3692	.3719	.3745	.3772	.3799	.3826
65	.3853	.3880	.3907	.3934	.3961	.3989	.4016	.4043	.4070	.4097
66	.4125	.4152	.4179	.4207	.4234	.4261	.4289	.4316	.4344	.4372
67	.4399	.4427	.4454	.4482	.4510	.4538	.4565	.4593	.4621	.4649
68	.4677	.4705	.4733	.4761	.4789	.4817	.4845	.4874	.4902	.4930
69	.4958	.4987	.5015	.5044	.5072	.5101	.5129	.5158	.5187	.5215
70	.5244	.5273	.5302	.5330	.5359	.5388	.5417	.5446	.5476	.5505
71	.5534	.5563	.5592	.5622	.5651	.5681	.5710	.5740	.5769	.5799
72	.5828	.5858	.5888	.5918	.5948	.5978	.6008	.6038	.6068	.6098
73	.6128	.6158	.6189	.6219	.6250	.6280	.6311	.6341	.6372	.6403
74	.6433	.6464	.6495	.6526	.6557	.6588	.6620	.6651	.6682	.6713
75	.6745	.6776	.6808	.6840	.6871	.6903	.6935	.6967	.6999	.7031
76	.7063	.7095	.7127	.7160	.7192	.7225	.7257	.7290	.7323	.7356
77	.7388	.7421	.7454	.7488	.7521	.7554	.7588	.7621	.7655	.7688
78	.7722	.7756	.7790	.7824	.7858	.7892	.7926	.7961	.7995	.8030
79	.8064	.8099	.8134	.8169	.8204	.8239	.8274	.8310	.8345	.8381
80	.8416	.8452	.8488	.8524	.8560	.8596	.8632	.8669	.8705	.8742
81	.8779	.8816	.8853	.8890	.8927	.8965	.9002	.9040	.9078	.9116
82	.9154	.9192	.9230	.9269	.9307	.9346	.9385	.9424	.9463	.9502
83	.9542	.9581	.9621	.9661	.9701	.9741	.9781	.9822	.9863	.9904
84	.9945	.9986	1.0027	1.0069	1.0110	1.0152	1.0194	1.0237	1.0279	1.0322
85	1.0364	1.0407	1.0450	1.0494	1.0537	1.0581	1.0625	1.0669	1.0714	1.0758
86	1.0803	1.0848	1.0893	1.0939	1.0985	1.1031	1.1077	1.1123	1.1170	1.1217
87	1.1264	1.1311	1.1359	1.1407	1.1455	1.1503	1.1552	1.1601	1.1650	1.1700
88	1.1750	1.1800	1.1850	1.1901	1.1952	1.2004	1.2055	1.2107	1.2160	1.2212
89	1.2265	1.2319	1.2372	1.2426	1.2481	1.2536	1.2591	1.2646	1.2702	1.2759
90	1.2815	1.2873	1.2930	1.2988	1.3047	1.3106	1.3165	1.3225	1.3285	1.3346
91	1.3408	1.3469	1.3532	1.3595	1.3658	1.3722	1.3787	1.3852	1.3917	1.3984
92	1.4051	1.4118	1.4187	1.4255	1.4325	1.4395	1.4466	1.4538	1.4611	1.4684
93	1.4758	1.4833	1.4908	1.4985	1.5063	1.5141	1.5220	1.5301	1.5382	1.5464
94	1.5548	1.5632	1.5718	1.5805	1.5893	1.5982	1.6072	1.6164	1.6258	1.6352
95	1.6448	1.6546	1.6646	1.6747	1.6849	1.6954	1.7060	1.7169	1.7279	1.7392
96	1.7507	1.7624	1.7744	1.7866	1.7991	1.8119	1.8250	1.8384	1.8522	1.8663
97	1.8808	1.8957	1.9110	1.9268	1.9431	1.9600	1.9774	1.9954	2.0141	2.0335
98	2.0537	2.0748	2.0969	2.1201	2.1444	2.1701	2.1973	2.2262	2.2571	2.2904
99	2.3263	2.3656	2.4089	2.4572	2.5121	2.5758	2.6520	2.7477	2.8781	3.0901

Musterlösung

Exam Statistics, winter semester 2020/21

1.1	☐ A ☐ B ☐ C ■ D ☐ E
1.2	☐ A ☐ B ☐ C ■ D ☐ E
1.3	☐ A ☐ B ☐ C ☐ D ■ E
1.4	■ A ☐ B ☐ C ☐ D ☐ E
1.5	☐ A ☐ B ☐ C ☐ D ■ E
1.6	☐ A ■ B ☐ C ☐ D ☐ E
1.7	☐ A ☐ B ■ C ☐ D ☐ E
1.8	☐ A ☐ B ☐ C ■ D ☐ E
1.9	☐ A ☐ B ■ C ☐ D ☐ E
1.10	☐ A ☐ B ■ C ☐ D ☐ E
1.11	☐ A ☐ B ☐ C ☐ D ■ E
1.12	☐ A ☐ B ☐ C ☐ D ■ E
1.13	☐ A ■ B ☐ C ☐ D ☐ E
1.14	☐ A ☐ B ■ C ☐ D ☐ E
1.15	☐ A ☐ B ☐ C ☐ D ■ E
1.16	■ A ☐ B ☐ C ☐ D ☐ E
1.17	☐ A ■ B ☐ C ☐ D ☐ E
1.18	☐ A ☐ B ■ C ☐ D ☐ E
1.19	☐ A ☐ B ■ C ☐ D ☐ E
1.20	☐ A ☐ B ☐ C ☐ D ■ E
1.21	☐ A ☐ B ■ C ☐ D ☐ E
1.22	☐ A ☐ B ■ C ☐ D ☐ E
1.23	☐ A ☐ B ☐ C ■ D ☐ E
1.24	■ A ☐ B ☐ C ☐ D ☐ E
1.25	☐ A ■ B ☐ C ☐ D ☐ E
2.1	☐ A ☐ B ☐ C ☐ D ■ E
2.2	☐ A ☐ B ■ C ☐ D ☐ E
2.3	■ A ☐ B ☐ C ☐ D ☐ E
2.4	☐ A ■ B ☐ C ☐ D ☐ E
2.5	☐ A ☐ B ☐ C ■ D ☐ E