

Preliminary schedule:

Date	Week	Exercises
18.04.2017	E1	1-1-c,e,g,i,k ; 1-2-a,b,d ; 1-3 ; 1-4 ; 1-5-a,b ; 1-6
25.04.2017	E2	1-7-C,D ; 1-8 ; 1-9-B; 1-10-A(a..e), 1-10-B(a,b,c) ; 1-11-a,b
02.05.2017	E3	2-1; 2-2; 2-3; 2-7
09.05.2017	E4	2-9; 2-19, 2-20
16.05.2017	E5	TBA
23.05.2017	E6	TBA
30.05.2017	E7	TBA
06.06.2017	E8	TBA
13.06.2017	E8	TBA
20.06.2017	E9	TBA
27.06.2017	E10	TBA
04.07.2017	E11	TBA
11.07.2017	E12	TBA
18.07.2017	E13	TBA

Review

- Slides: Introduction, Descriptive Statistics 50-99/788

Statistics

science; information itself, methods/processes to work with this information

Descriptive Statistics

quantitative description/summary of sample

Steps of Stat.Survey (plan, survey, analysis,interpretation)

Statistical unit/individual object or process, which carries specific information/characteristics
set of individuals is called population

Variable (X)

characteristic of unit ; having values x_1, x_2, \dots, x_n

Sample

subset from st.population

Scales / Levels of measurement

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Qualitative – Nominal
(gender,...!binary) – Ordinal (can be sorted) | <ul style="list-style-type: none"> • Quantitative – Interval – Ratio –Absolute | <p>or</p> <ul style="list-style-type: none"> – Continuous – Discrete |
|---|--|--|

Notation

Random variable X having n numbers of observations x_1, \dots, x_n

Exercises - Leftovers from 25.4.

E1-10-A

State the 1st derivative of:

c) $f(x) = 3x \log x$ d) $f(x) = \frac{(x+1)^2}{1-x^2}$ e) $f(x) = xe^{x^2}$

E1-10-B

State the partial derivative of:

a) $\frac{\partial}{\partial \alpha} \sum_{i=1}^n (x_i + \alpha x_i^2 - \alpha^2 x_i y_i)$

b) $\frac{\partial}{\partial \alpha} \sum_{i=1}^n (x_i - \alpha)^2$

c) $\frac{\partial}{\partial \alpha} \sum_{i=1}^n (\alpha x_i + \beta)^2$

E1-11-A

Compute:

a) $\int_0^5 x^4 dx$ b) $\int_0^1 e^x (e^{-x} - 1) dx$ c) $\int_e^{e^2} \left(\frac{1}{x} + 1\right) dx$

E1-11-B

Find the antiderivative/primitive function for:

a) $f(x) = e^{\log x}$ b) $f(x) = \frac{1}{x^3} + 4x^5 + x^7$ c) $f(x) = e^{3x}$

Exercises (-new)

Exercise 2-1 The Department of Finance of the Senate of Berlin provides the statistical analysis of the revenues and expenditures in 2017 for all Berlin stages.

- A) What is the basic statistical population, what are the individual statistical units (examples)?
- B) What statistical characteristics/variables are observed? Which characteristics are identification criteria and which are the survey characteristics?
- C) Name other possible identifiable characteristics/variables in this population.

Exercise 2-2

In a German city K the saving behavior of workers is examined in March 2017. By what objective, spatial and time characteristics is examined population identified?

Exercise 2-3

Specify the scale of the following characteristics:

- 1) gender
- 2) temperature in Celsius
- 3) height (of the body)
- 4) number of children
- 5) post code
- 6) notes at school
- 7) company size (classified)
- 8) standard deviation
- 9) length of workpiece
- 10) subscribed newspapers
- 11) nationality
- 12) election result of a party
- 13) military ranks
- 14) fares (for ticket)
- 15) leisure activities
- 16) number of books in a library
- 17) strength of wind
- 18) speed
- 19) shirt numbers of football players
- 20) difficulty level (of climbing tour)
- 21) car consumption (for 100 km)
- 22) tariff class (for car liability insurance)
- 23) quality class
- 24) price of any commodity
- 25) age
- 26) income
- 27) marital status
- 28) vocation learnt
- 29) date(year) of the birth
- 30) number of pages (of book)
- 31) cause of death

- 32) annual turnover
- 33) land area
- 34) field of study
- 35) latitude (of the earth)
- 36) quality class (for fruit)
- 37) eye colour
- 38) place of residence
- 39) telephone number
- 40) aggressiveness
- 41) legal form of the company
- 42) intelligence
- 43) social status
- 44) financing (fundings) of studies
- 45) production time
- 46) number of semesters
- 47) exam results - points

Exercise 2-7

The insurance company collected the data about car compulsory insurance. Among the others, they collect the info about: age, gender, profession, place of residence, the duration of insurance contract, the number of claims incurred so far and total damage (in EUR).

- A) Determine the statistical units and the population.
- B) Which statistical characteristics/variables should be collected? Characterize these variables.
- C) Indicate the possible values of these characteristics.