

PROBLEMS BY EXAMPLES

The following problems are examples for practical exam in Medical Informatics and Biostatistics. You will have at the exam some problems that will sum a number of 9 points out of 10 (see the points in round branches at the beginning of the problem).

Request 1.

(1 point) Create on your partition of the server a new folder named **Recapitulation**.

Request 2.

(0.5 points) Create a Word document with the following content. (In order to obtain all points your text must to look exactly like the one in the image bellow):

What is Evidence-Based Practice?

"Evidence based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. This practice means integrating individual clinical experience with the best available external clinical evidence from systematic research". (Sackett et al., BMJ, 1996, 312, pp.72-3)

So, to practice it we need to:

- Be conscientious.
- Be explicit.
- Relate to specific problems.
- Integrate individual clinical experience.
- Look for current best evidence.

(0.5 points) Inset as header "Evidence-Based Medicine". Insert page number.

(0.5 points) Create on the second page of the document the following table:

2×2 General Contingency Table

	Disease+	Disease-	Total
Test+	a	b	a+b
Test-	c	d	c+d
Total	a+c	b+d	a+b+c+d

Include in the same sheet the following formula:

$$\text{Accuracy} = \frac{a + d}{a + b + c + d}$$

(0.5 points) Save this document in **Recapitulation** folder as **WordRecapitulation**.

Problem for requests 3 - 15

An anthropometric study was conducted on the newborn children born in 1st Gynecological Clinic in Cluj-Napoca between 1st January and 31 March 2005. The following variables were collected: sex, ethnicity, the living place (rural or urban), weight (g), length (cm), cranial perimeter (cm), and thoracic perimeter (cm). Data were stored into the **Antro.xlsx** Excel file.

Request 3. (Eliminatory)

(1 point) Compute for each patient the energy needs (estimated energy requirements based on basic body metabolism, growth and activity; units of measurements kcal). Use the following formula:

$$(89 \cdot \text{weight}[\text{kg}] - 100) + 175$$

Request 4. (Eliminatory)

(1 point) Compute descriptive statistics parameters for the quantitative variables.

Request 5. (Eliminatory)

(1 point) Represent graphically the relation between thoracic perimeter and cranial perimeter. Interpret your graphic.

Request 6. (Eliminatory)

(1 point) Represent graphically each qualitative variable.

Request 7. (Eliminatory)

(1 point) Create the histogram for the **Energy needs** variable.

Request 8. (Eliminatory)

(1 point) Is there a statistically significant correlation between the Weight of the newborns (grams) and Length (cm)?

Request 9. (Eliminatory)

(1 point) Is there a statistically significant difference between the mean of the weight at birth in patients from urban and rural? Use the 95% confidence intervals for mean in order to answer to this question.

Request 10. (Eliminatory)

(1 point) Is there a statistically significant correlation between the Weight of the newborns (grams) and Length (cm)?

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation.

Request 11. (Eliminatory)

(1 point) Is there a statistically significant difference between the mean of the weight at birth in patients from urban and rural?

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation

Request 12. (Eliminatory)

(1 point) Is there a statistically significant difference between the mean of the male and female thoracic perimeter?

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation.

Request 13. (Eliminatory)

(1 point) Is there a significant difference between Body Mass Index of patients from rural compared with the patients from urban?

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation.

The formula for body mass index is: $\text{BMI} (\text{kg}/\text{m}^2) = (\text{weight}(\text{kg})) / (\text{height}(\text{m}^2))$

Request 14. (Eliminatory)

(1 point) Is sex dependent by living place?

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation.

Request 15. (Eliminatory)

(1 point) Is sex a risk factor for underweight?

A new born is considered underweight if weight at birth is less than 2.2 kg.

State the null and alternative hypothesis. & Interpret the results from statistical and clinical point of views by using a PowerPoint presentation.