

CS 1 Lab 5

1. Open file *ANKIETA.XLS* (sheet 1) from the diskette and answer following questions, what is:

- the number of men and women
- the average salary of women in Myslenice
- the lowest salary among men in Myslenice
- % of women with the high school education
- % of men with the salary higher than the average salary of women from Myslenice

2. Calculate the roots of the following equations:

- $y = \operatorname{tg}x - 2x$, $x \in \langle 0; 2\pi \rangle$
- $y = \ln x - x + 2$
- $y = \cos^2 x - (x + 0,1)^2$

3. Open the file *ANKIETA.XLS* (sheet 2) and perform indicated calculations.

4. Open the file *ANKIETA.XLS* (sheet 3) and calculate :

- Average fuel consumption (per 100 km) between each refueling.
- Average fuel consumption (per 100 km) during the whole journey.
- Mark each part of the journey with higher than average fuel consumption.

5. Open the file *ANKIETA.XLS* (sheet 5) "Examination of the fan" with the measured values: p_{stat} , Δp - ciśnienia [Pa]; i - current [A]; U - voltage [V]; n - rotation velocity [rpm]. Additional data: $p_0 = 0,1$ MPa, $T_0 = 290$ K, $d = 0,12$ [m] (diameter of the valve), $D = 0,30$ [m] (diameter of the pipe). Use the following formulas to calculate:

$$\rho = \frac{p_0 + p_{\text{stat}}}{287 \cdot T_0} \text{ [kg / m}^3\text{]; } w_2 = 0,97 \cdot \sqrt{\frac{2 \cdot \Delta p}{\rho}} \text{ [m / s]; } Q = \frac{\pi \cdot d^2}{4} \cdot w_2 \text{ [m}^3\text{ / s]; } w_1 = \frac{4 \cdot Q}{\pi \cdot D^2} \text{ [m / s]; } p_d = \frac{w_1^2}{2} \cdot \rho \text{ [Pa]}$$

$$H_c = p_d + p_{\text{stat}} \text{ [Pa]; } N_{el} = i \cdot U \text{ [W]; } N_u = H_c \cdot Q \text{ [W]; } \eta = \frac{N_u}{N_{el}};$$

Create the plots: $\eta = f(n)$ and $N_u = f(Q)$