**REPORT**

Zajęcia: Analog and digital electronic circuits

Teacher: prof. dr hab. Vasyl Martsenyuk

**Lab 5 and 6**

17.02.2025

**Topic:**

5. Digital Filter Design and Analysis: Implementing FIR and IIR filters in Python.

6. Adaptive Filtering: Applying adaptive filtering algorithms to noise reduction.ls

**Variant 15**

Tobiasz Wojnar  
 Informatyka II stopień,   
niestacjonarne,   
1 semestr,   
Gr. B

# 1. Problem statement:

The goal of this task is to design FIR, IIR and LMS filters in Python.

1. FIR filter with the following coefficients and implement it in Python to reduce noise in a noisy sinusoidal signal.
2. IIR filter with the following coefficients and implement it in Python to reduce noise in the same noisy sinusoidal signal.
3. Adaptive LMS filter in Python to reduce noise in the same noisy sinusoidal signal.

# 2. Input data:

1. FIR Filter Coefficients: b = {0.2, 0.3, 0.5}
2. IIR Filter Coefficients: b = {1, 0.5}, a = {1, −0.7}
3. LMS filter with a step size µ = 0.05 and filter length M = 6

# 3. Commands used (or GUI):

## a) source code

## b) screenshots

## c) Link to remote repositorium

<https://github.com/TobiaszWojnar/DSP>

# 4. Outcomes:

Results from console, screenshots etc.

# 5. Conclusions

For the reasons given, we conclude that ????????????