Mini Project I: General signal generator

It is required to implement a general signal generator that has the following specifications:

1. When the program starts the program asks the user for the following parameters:
    a. Sampling frequency of signal.
    b. Start and end of time scale
    c. Number of the break points and their positions (i.e. the points that the signal definition rule changes).

    Example: The signal is defined from -2:0 as a DC signal and from 0:2 as ramp the user will enter that the number of break points =1 and the position at t=0.

2. According to the number of break points the program asks the user at each region to enter the specifications of the signal at this region Which are:

    a. DC signal: Amplitude.
    b. Ramp signal: slope – intercept.
    c. General order polynomial: Amplitude-power – intercept.
    d. Exponential signal: Amplitude – exponent.
    e. Sinusoidal signal: Amplitude – frequency – phase.
    f. Sinc function: Amplitude – center shift.
    g. Triangle pulse: Amplitude – center shift- width.

3. Display the resulting signal in time domain.
4. the program asks the user if he wants to perform any operation on the signal
    a. Amplitude Scaling: scale value.
    b. Time reversal.
    c. Time shift: shift value.
    d. Expanding the signal: expanding value
    e. Compressing the signal: compressing value
    f. Clipping the signal: upper and Lower clipping values
    g. The first derivative of the signal.
    h. None

5. Display the new signal in time domain

Submission regulations (Read carefully):

1. You should solve **in a group** of (4) students.
2. Each group should submit a softcopy report including screenshots for the output of the code, m file of the project and hardcopy report during the discussion.
3. Submission deadline and discussion: within the 10th week starting 13/4/2024.
4. Copied codes will take **zero**
5. Any group may be asked to explain any step in the program and his/her report in the discussion.