**EXPERIMENT 7 DISCRETE TIME SYSTEMS**

**DATE:**

1. A causal M-tap moving average filter is given by equation: . The signal x(n) is finite duration sequence starting at n=0 and end at n=N. Write a program to read x(n) and its indices, compute y(n) and its indices. Plot x(n) and y(n) in same plot, give proper labels and titles.
2. A cumulative average system is given by equation: . The signal x(n) is finite duration sequence starting at n=0 and end at n=N. Write a program to read x(n) and its indices, compute y(n) and its indices. Plot x(n) and y(n) in same plot, give proper labels and titles.

**EXPERIMENT 8 DISCRETE TIME SYSTEMS**

**DATE:**

1. An accumulator is given by equation: . The signal x(n) is finite duration sequence starting at n=0 and end at n=N. Write a program to read x(n) and its indices, compute y(n) and its indices. Plot x(n) and y(n) in same plot, give proper labels and titles.
2. A discrete integrating system is given by equation: . The signal x(n) is finite duration sequence starting at n=0 and end at n=N. Write a program to read x(n) and its indices, compute y(n) and its indices. Plot x(n) and y(n) in same plot, give proper labels and titles.

**EXPERIMENT 9 Laplace Transform and Difference Equations**

**DATE:**

1. Given a rational polynomial (transfer function) H(s) = B(s)/A(s). Write a program to obtain poles and zeros of this transfer function. Also, obtain residues to expand it using partial fraction. Use proper inbuilt functions’.
2. Write a program to determine the unit impulse response for the following DT LTI systems described by their constant coefficient difference equation. Assume all LTI systems are initially relaxed (i.e. causal).
3. *y*(*n*) - ⅓ *y*(*n* – 1) = *x*(*n*)
4. *y*(*n*) – 0.75 *y*(*n* – 1) + 0.125 *y*(*n* – 2)= *x*(*n*)
5. *y*(*n*) – 0.7 *y*(*n* – 1) + 0.1 *y*(*n* – 2) = 2 *x*(*n*) – *x*(*n* – 2)
6. *y*(*n*) – 0.7 *y*(*n* – 1) + 0.12 *y*(*n* – 2) = *x*(*n* – 1) + *x*(*n* – 2)

**EXPERIMENT 10 FREQUENCY RESPONSE AND BODE PLOTS**

**DATE:**

For the RC low pass filter(integrator) circuit shown in figure, obtain the transfer function and write a program to obtain the frequency response(steady state response) of the circuit by plotting magnitude and phase plots (also called bode plots) for given values of R and C on semilog graph. The magnitude plot must have magnitude in dB. Use the inbuilt functions to generate frequency response. Use inbuilt function for plotting frequency response. Verify the cut-off frequency from the graph.





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and