Homework 3

IEOR: 4574

Due date: Feb. 17

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- **Question 1:** In the class we discussed Convolution and MA. Run the attached HW3_Convolution_MA_Code code to create a MA, and Convolution of an equally weighted rectangular wave for ice cream, viscosity, Wholefoods, and Pharmaceutical datasets as follows: [**Points 30**]

    - MA(5), and convolution with a rectangular wave of equally weighted size 5.

    - MA(10), and convolution with a rectangular wave of equally weighted size 10.

    - MA(20), and convolution with a rectangular wave of equally weighted size 20.

    Submit appropriately labeled visuals.

- **Question 2:** Run the attached HW3_AR_Code code to create a Normal AR processes as follows: [**Points 40**]
    - $AR(1)$ $c = 0$, $\phi = 0.01$, 0.5, and 0.9.

    - $AR(2)$ $c = 0$, $\phi_1 = 0.01$, $\phi_2 = 0.01$.

    - $AR(2)$ $c = 0$, $\phi_1 = 0.5$, $\phi_2 = 0.5$.

    - $AR(2)$ $c = 0$, $\phi_1 = 0.9$, $\phi_2 = 0.9$.

    Submit appropriately labeled visuals.

- **Question 3:** Run the Butterworth Filter in LP or Band Pass (BP) mode as appropriate on the four data sets [**Points 30**].