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IIIT Vadodara
Autumn 2018-19
TE3 Computer Vision
Lab-1: Fundamentals of numerical/error analysis in linear inverse systems

Q. 1: (i) Solve the following set of linear equations:

$$2.0x_1 + 2.0x_2 = 6.0 \tag{1}$$

$$2.0x_1 + 2.0005x_2 = 6.001 \tag{2}$$

Now consider this: the coefficient x_2 is changed to 2.001 in equation (2) due to limited (finite) precision of the computer while all other entries remain the same. (ii) Find the new solution to the set of equations. (iii) From this find the relative error in the coefficient matrix and the corresponding relative errors in the obtained solutions. (iv) Using this set of relative errors conclude on whether this problem is *ill-posed* or better-posed. Note that the set of linear equations can be written in matrix form $\mathbf{A}x = b$, where $\mathbf{A}$ is the coefficient matrix.

Find analytical answers and compare them with the practical results.

Q. 2: Plot following signals.