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MATLAB EXERCISE 7

Use the same measurement data and convolution matrices as in the previous exercises.

(1) Solve the convolution problems using CGLS method.

(a) $k = 1$, initialize:

Choose $x_1, \quad d_1 = m - Ax_1, \quad r_1 = A^T d_1, \quad p_1 = r_1, \quad y_1 = Ap_1.$

(b) Iterate till the stopping condition is fulfilled *or the maximum number of iterations are made:*

$$\alpha_k = \frac{||r_k||^2}{||y_k||^2},$$
$$x_{k+1} = x_k + \alpha_k p_k,$$
$$d_{k+1} = d_k - \alpha_k y_k,$$
$$r_{k+1} = A^T d_{k+1},$$
$$\beta_{k+1} = \frac{||r_{k+1}||^2}{||r_k||^2},$$
$$p_{k+1} = r_{k+1} + \beta_{k+1} s_k,$$
$$y_{k+1} = As_{k+1}.$$

As a stopping condition use Morozov discrepancy principle.