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INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

MA 423: Matrix Computations Lab
Lab 06

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Question 1,2,3.

The function programs have been written as required.

Question 4.

From the table below, we see that all 5 quantities, namely, norm(QR-A),norm(Q'*Q—eye(m)),norm(tril(R,—1)),norm(R—Rhat),and norm(Q—Q_hat) are ~ u.

N	M	norm(Q*R - A)	norm(tr(Q)*Q - eye(m))	norm(tril(R, -1))	norm(R - Rhat)	norm(Q - Qhat)
4.0000e+00	3.0000e+00	8.3569e-16	3.4692e-16	0.0000e+00	2.2204e-16	2.3601e-16
5.0000e+00	5.0000e+00	1.3231e-15	7.7123e-16	0.0000e+00	1.0194e-15	4.0053e-16
8.0000e+00	7.0000e+00	8.6827e-16	4.8711e-16	0.0000e+00	1.2343e-15	1.2984e-15
1.5000e+01	1.3000e+01	3.4137e-15	9.6372e-16	0.0000e+00	2.6828e-15	1.5281e-15
1.7000e+01	1.5000e+01	3.1542e-15	8.3166e-16	0.0000e+00	4.6062e-15	2.9568e-15
2.1000e+01	2.0000e+01	4.4260e-15	1.0089e-15	0.0000e+00	4.8907e-15	2.8762e-15

Question 5.

The following residual norms are obtained from the methods given in the assignment.

$||r_1||_2$= 8.186805781443002e-13
$||r_2||_2$= 1.109739905876262e-09
$||r_3||_2$= 8.182146459590739e-13

The methods 1 and 3 give comparable error so any one of them can be used as the best fit.