Acheev Bhagat (UID: 114714336)

Matlab 5

Problem 1:

P =

-0.5268	-0.0364	0.6877	0.2012	0.4558
0.4696	-0.6903	0.1045	-0.2883	0.4572
-0.1396	0.4783	-0.1655	-0.7245	0.4465
-0.4670	-0.2976	-0.6958	0.2768	0.3640
0.5141	0.4526	-0.0679	0.5242	0.5014

If basis (P) is orthogonal, P' * P == I

basisP =

4.0704e-16

The resulting value is small enough with rounding error that basis P is orthogonal.

Problem 2:

V =

-10	3	6	0
2	3	0	5
-6	-3	6	0
16	0	6	0
2	3	0	-5

Problem 3:

checkRank =

2

x =

1.0000	0	9.2802	-57.3951	0
0	1.0000	-8.4403	59.4996	0
0	0	0	0	1.0000

0 0 0 0 0

The system is inconsistent.

x0 =

-0.3659

-0.2708

0.4824

1.6264

x0 is a least solution of Ax = b but x0 is not a unique solution.

error =

-0.1126

0.2198

0.0740

-0.1506

perpindicular =

1.0e-15 *

-0.0833 -0.0798 -0.1110 0.0278

The resulting vector is small enough with rounding error so that it is essentially 0. The error vector is perpendicular to the column space of A.

err1 =

0.2986

err2 =

2.0693

err3 =

1.6319

err4 =

0.5300

The error values are all larger than the error.

Problem 4:

QRminA =

2.2204e-16

QtQInv =

3.3307e-16

The resulting maximum value in each result matrix is close enough to 0 with rounding error.

Problem 5:

B =

1.4509

0.8111

The orbit is an ellipse because e < 1.

r =

1.3300

Problem 6:

B =

-0.8558

4.7025

5.5554

-0.0274

y(t) = -.8558 + 4.7025t + 5.5554t^2 - .0274t^3

v(t) = dy/dt

v(t)= 4.7025 + 11.1108t - .0822t^2

velocity =

53.0365