

PROBLEMS 6a, 6b - OUTPUT

MATLAB Command Window

June 23, 2018

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>> finiteDifApprox
FORWARD DIFFERENCE APPROXIMATION
h = 5.00000000e-01, error = -2.02221084e-01, error / h = -4.04442167e-01, error / h^2 = -8.08884334e-01, error / h^3 = -1.61776867e+00
h = 2.50000000e-01, error = -9.52716617e-02, error / h = -3.81086647e-01, error / h^2 = -1.52434659e+00, error / h^3 = -6.09738635e+00
h = 1.25000000e-01, error = -4.59766451e-02, error / h = -3.67813161e-01, error / h^2 = -2.94250529e+00, error / h^3 = -2.35400423e+01
h = 6.25000000e-02, error = -2.25501609e-02, error / h = -3.60802574e-01, error / h^2 = -5.77284118e+00, error / h^3 = -9.23654589e+01
h = 3.12500000e-02, error = -1.11627277e-02, error / h = -3.57207287e-01, error / h^2 = -1.14306332e+01, error / h^3 = -3.65780262e+02
h = 1.56250000e-02, error = -5.55293123e-03, error / h = -3.55387599e-01, error / h^2 = -2.27448063e+01, error / h^3 = -1.45566761e+03
CENTRAL DIFFERENCE APPROXIMATION
h = 5.00000000e-01, error = -5.37604256e-01, error / h = -1.07520851e+00, error / h^2 = -2.15041703e+00, error / h^3 = -4.30083405e+00
h = 2.50000000e-01, error = -6.63371527e-01, error / h = -2.65348611e+00, error / h^2 = -1.06139444e+01, error / h^3 = -4.24557777e+01
h = 1.25000000e-01, error = -6.96086988e-01, error / h = -5.56869590e+00, error / h^2 = -4.45495672e+01, error / h^3 = -3.56396538e+02
h = 6.25000000e-02, error = -7.04346443e-01, error / h = -1.12695431e+01, error / h^2 = -1.80312689e+02, error / h^3 = -2.88500303e+03
h = 3.12500000e-02, error = -7.06416360e-01, error / h = -2.26053235e+01, error / h^2 = -7.23370352e+02, error / h^3 = -2.31478513e+04
h = 1.56250000e-02, error = -7.06934155e-01, error / h = -4.52437859e+01, error / h^2 = -2.89560230e+03, error / h^3 = -1.85318547e+05
Forward difference is more accurate since error is proportional to h and central difference involves twice as much h as forward difference
>>
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