

Introduction to Week Five

Initial Value Problems

Systems of Differential Equations

Initial Value Problems in MATLAB

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Video: Adaptive Runge-Kutta Method | Lecture 54
13 min
- ✓

Reading: Example of Adaptive Integration
10 min
- ▶

Video: Integrating ODEs in MATLAB (Part A) | Lecture 55
15 min
- ▶

Video: Integrating ODEs in MATLAB (Part B) | Lecture 56
7 min
- 📄

Ungraded External Tool: The Lorenz Equations
30 min

Boundary Value Problems

Quiz

Programming Assignment: The Two-Body Problem

Example of Adaptive Integration

Using the Dormand-Prince method, suppose that a user requests an error tolerance of $\varepsilon = 10^{-6}$, and suppose the time step attempted was $\Delta t = 0.01$ and that $e = |x_{n+1} - X_{n+1}| = 1.1 \times 10^{-6}$. Is the current time step accepted? What time step will be used next? Assume a safety factor of 0.9.

✓ Completed Go to next item

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