
LAB 6

Solve the following two-point boundary value problems using the second order finite difference scheme:

1.

$$\begin{aligned}u'' + u &= f, & -1 < t < 1, \\u(-1) &= u(1) = 0,\end{aligned}$$

with $f \in C([-1, 1])$. Check your code on at least three problems with different choices of f (for which you know how to obtain the exact solution).

2.

$$\begin{aligned}u'' + u &= \frac{2(u')^2}{u}, & -1 < t < 1, \\u(-1) &= u(1) = (e + e^{-1})^{-1}.\end{aligned}$$