LAB 5

Solve the following two-point boundary value problems using the shooting method (with Newton iterations and RK4 for the solution of the IVP problems):

1.

$$u'' + u = f, \quad -1 < t < 1,$$
$$u(-1) = u(1) = 0,$$

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.

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