Michael E. Taylor's Partial Differential Equations I - Basic Theory

1. **Exercise 3.12.1.** Write a computer program to implement the FFT via (12.21)-(12.23). Try to make it run as fast as possible.

2. **Exercise 3.12.2.** Using the FFT, write a computer program to solve numerically the initial-value problem for the heat equation $\partial u/\partial t - u_{xx} = 0$ on $\mathrm{R}^+ \times S^1$.