

# Programming techniques for physical simulations

## Exercise 2

September 23, 2009

Write a program to perform the integration

$$I(a, b) = \int_a^b \sin(x) dx$$

using the Simpson rule. Your program should take the interval  $[a, b]$  and the number of subintervals  $N$  as input parameters, calculate the integral and print out  $h = \frac{b-a}{N}$  and the value of the integral. Calculate the integral for different values of  $h$  and plot the error

$$\epsilon = |I(a, b) - I_{\text{exact}}(a, b)|.$$

How does the error behave with  $h$ ?