

## HW4

Calculate the volume of a unit  $d$ -dimensional sphere at  $d = 4$ ,  $d = 6$ ,  $d = 8$ ,  $d = 10$  and  $d = 12$  using the Monte-Carlo method. Can you guess a general formula for the volume of  $d$ -dimensional sphere? Hint: it is  $\pi^{d/2}$  divided by some simple function of  $d$  which is easy to guess if you consider even  $d$ .

P.S. A unit  $d$ -dimensional sphere is defined as a set  $\{x_1, x_2, \dots, x_d\}$  such that  $x_1^2 + x_2^2 + \dots + x_d^2 \leq 1$ .