

Lab 6 (Monte Carlo)

STA-360/602, Spring 2018

February 16, 2019

This will be worked in lab and will not be turned in for credit.

Estimate

$$I = \int_{-\infty}^{\infty} \exp(-x^4) dx$$

1. Task 1: Evaluate I using substitution and the gamma function.¹
2. Task 2: Estimate I using Monte Carlo. How does this compare to the exact value obtain in Task 1?
3. Task 3: Estimate I using importance sampling. How does this compare to the exact value obtain in Task 1?

¹This is not an approximation given that we can actually compute the integral exactly. We will use this exact expression when comparing to Monte Carlo and Importance sampling in the other tasks below.