

## Homework 5

Total points : 15

1. Generate  $10^{20}$  many observations from the standard normal distribution using the idea of parallel computing.

Points : 7.5

2. Let  $X = (X_1, \dots, X_{10^{20}})$  be a random vector associated with  $10^{20}$  dimensional normal distribution with  $E(X_i) = 0$ ,  $\text{Var}(X_i) = 1$  and Corrwlation  $(X_i, X_j) = 0.6$  for all  $i \neq j = 1, \dots, 10^{20}$ . Compute  $P[\|X\| > 0.75]$ .

Points : 7.5

**Deadline:** Deadline of submission is April 18, 2025.

**Remark:** You can use any package or any programming language to carry out the study.