CIS3900-002: Mathematics of Machine Learning	Fall 2023
Homework 2	
Release Date: September 13, 2023	*Due Date: September 20, 2023*

1   Written Questions

- **6.3** from the textbook.

- **6.12** from the textbook.

- **MGF/Chernoff.** Let $X_1, \ldots, X_N$ be i.i.d. random variables, with moment generating function $m_X(t) = \mathbb{E}[e^{tX}]$ and mean $\mu = \mathbb{E}[X]$. Consider the average of all N random variables: $Y = \frac{1}{N} \sum_{i=1}^{N} X_i$. Derive the form of $m_Y(t)$, the moment generating function for Y, and use the Chernoff method to derive a tail bound.