1. An experiment is performed testing the effectiveness of a new filtering device to filter contaminants out of water. The remaining water impurities are recorded (by mass in mg) in the table.

2.05	2.13	0.98	0.74	1.63

   (a) Calculate the sample mean and sample variance.

   Assume that the water filter leaves impurities of, on average, 1.5mg, with variance 0.2.

   (b) What is the probability of the average being more than 3.5mg in a sample of 100 separate filtrations?

   (c) A small town of 10000 residents combines water filtered by all residents together in a reservoir. What is the probability that the total mass of impurities is over 14.95 grams?

2. (a) According to NYU, 47% of the class of 2020 studied abroad. Out of a group of 50 students, what is the approximate probability that at least half studied abroad?