1. A researcher, interested in studying gender differences in diet, collects data on the diets that men and women consumed. A nationwide database of the daily diets in the United States provides 24,000 records in the past year as the target population, displayed in the spreadsheet “Diet” of Stat_2013_1_Mid.xlsx and the columns of this spreadsheet are defined as follows:

Column	Column Name	Description
A	Frame No.	The frame list record number
B	Gender	The gender (F: Female; M:Male)
C	Age	The age (1: 19~35; 2: 36~50; 3: above 50)
D	Fruit and Vegetables	The number of servings of fruits and vegetables per day

(1) (2 points) Please compute the averages and the standard deviations of the number of servings of fruits and vegetables per day for the entire population list.

(2) (2 points) Please use random number generator (seed = 32535) to generate 240 random numbers and utilize these random numbers as ID to draw a sample of 240 from the population list. Calculate the averages and the standard deviations of the number of servings of fruits and vegetables per day based on this sample.

(3) (4 points) Please classify the population list into two groups based on “Gender”. Use random number generator (seed 1 = 18765 and seed 2 = 14327) to generate 240 random numbers and utilize these random numbers to draw a sample of 240. Calculate the averages and the standard deviations of the number of servings of fruits and vegetables per day based on this sample.

(4) (6 points) Please classify the population list into three groups based on “Age”. Use random number generator (seed 1 = 12121, seed 2 = 14561 and seed 3 = 19991) to generate 240 random numbers and utilize these random numbers to draw a sample of 240. Calculate the averages and the standard deviations of the number of servings of fruits and vegetables per day based on this sample.

(5) (3 points) Please calculate the sampling errors using the above sampling methods, (2), (3) and (4), and explain the results.

(6) (3 points) Based on the averages and the standard deviations of the number of servings of fruits and vegetables per day from the sampling results, please clarify the sampling method (either clustering or stratification) used in (3) and (4). Please explain. Is there is a gender difference in the diet? Is there an age difference in the diet?