Final-Assignment-Q.3 (26 marks)

We consider a population of individuals of size M =62 000. This population is made up of N = 15 000 households. We denote:

$$M_i = \textbf{Size of the household i (Number of individual)},$$

$$y_i = \textbf{Number of men of the household i}$$

The data from the sample required for the calculations are shown in Table below.

Household identifier	M_i	y_i
1	5	1
2	6	3
3	3	1
4	3	1
5	2	1
...	...	...
...	...	...
...	...	...
25	2	1
26	4	3
27	3	1
28	4	2
29	2	1
30	4	2

$$\sum_{i=1}^{30} M_i = 104, \qquad \sum_{i=1}^{30} y_i = 53, \qquad \sum_{i=1}^{30} M_i^2 = 404, \qquad \sum_{i=1}^{30} y_i^2 = 117,$$

$$\sum_{i=1}^{30} y_i M_i = 206, \qquad \sum_{i=1}^{30} \left(\frac{y_i}{M_i}\right)^2 = 8.5, \qquad \sum_{i=1}^{30} \frac{y_i}{M_i} = 14.9,$$

In this question we have three parts: Part 1, Part 2 and Part 3. All these parts use the same sample date above.