Key, Lab 4.5: Probability, Population, and Sample

Objectives

(5 points) To use sampling from a known population to illustrate the meaning of probability:

1. As a population proportion.
2. As a limit of sample proportions.

Lab Procedure

I.B. Figure 1 **(5 points)**

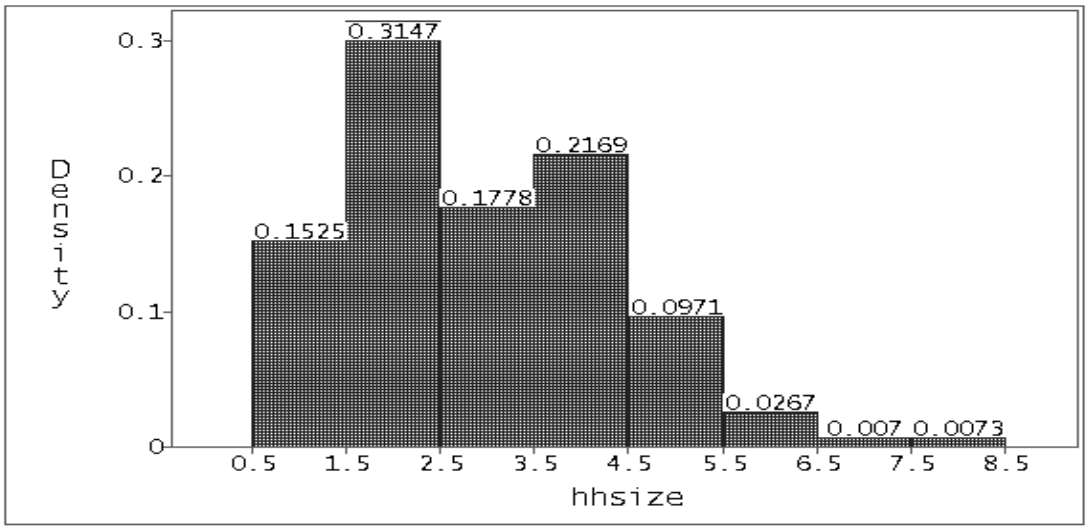

Figure 1: *Population histogram of HHSIZE.*

I.C. Figure 2 **(5 points)**

II.A.1. The population proportions of household sizes are **(5 points)**

Size	Probability
1	0.1525
2	0.3147
3	0.1778
4	0.2168
5	0.0971
6	0.0267
7	0.0070
8	0.0073

Interpretation: 15.25% of all households have one member, 31.47% have two members, etc. **(5 points)**

II.A.2. The probability a household randomly-selected from the population has income between \$15,000 and \$50,000 is 0.4303. This is also the population proportion of households having income between \$15,000 and \$50,000. **(5 points)**

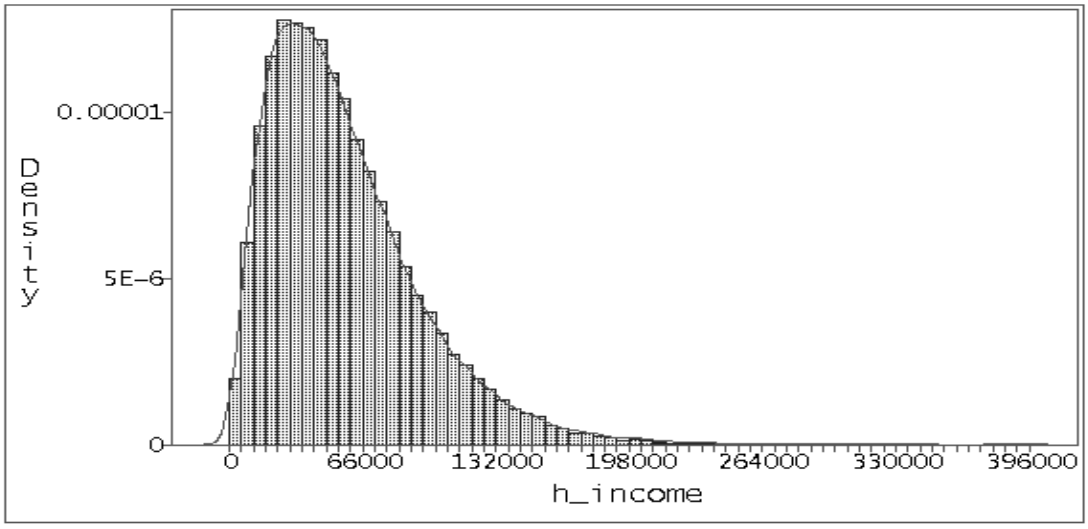

Figure 2: *Population histogram with Density Curve for H_INCOME.*

II.B.1. These numbers will be different in different lab reports. I got the following in one set of samples: **(15 points)**

Size	Probability	Proportion Sample Size 50	Proportion in Sample Size 500	Proportion in Sample Size 5000
1	0.1525	0.1800	0.1440	0.1570
2	0.3147	0.2400	0.3000	0.3096
3	0.1778	0.1800	0.1840	0.1742
4	0.2168	0.2800	0.2120	0.2150
5	0.0971	0.1000	0.1040	0.0954
6	0.0267	0.0000	0.0360	0.0314
7	0.0070	0.0200	0.0160	0.0740
8	0.0073	0.0000	0.0040	0.0100

II.B.2. The population proportion (probability) of incomes between \$15,000 and \$50,000 is 0.4303. The proportions I obtained from the samples of size 50, 500, and 5000 were 0.36, 0.4440, and 0.4284, respectively. **(5 points)**