# Problem Set 01
## Labor Force, Household Expenditure and Income Survey Exercises
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Using the raw data from the Labor Force Survey of 1401 and the summary statistics and expenditure data for the entire country from 1401, along with the questionnaire and other related documents provided, please answer the following questions.

For questions one to four, use the data from the Labor Force Survey, and for questions five to eight, use the data from the Household Expenditure and Income Survey for the entire country and its summary when needed.

# 1 - Labor Force Participation and Unemployment Rates

Calculate and report the labor force participation rate and unemployment rate for individuals at the following education levels:

- Below high school and high school

- Bachelor's degree

- Master's degree and higher

Report the results separately for men and women. You should report six rates for men and six rates for women.

# 2 - Distribution of Unemployment Rate and Employment-to-Population Ratio by Age

Plot the unemployment rate and employment-to-population ratio by age on a graph.

**Note:** The working age is defined as 15 years and above; therefore, you do not need to plot data for individuals below 15.

# 3 - Employment in Three Sectors by Firm Size

Using ISIC codes, create a bar chart that displays the number of employed individuals in agriculture, industry, and services, categorized by firm size.

**Guidance:** Use ISIC codes to categorize sectors and question 12 of the questionnaire to classify firms by size.

# 4 - Hours Worked by Insured and Uninsured Workers

Calculate the average weekly working hours for insured and uninsured workers across various occupations. Conduct a test to determine whether there is a significant difference in working hours across occupation categories.

**Guidance:** Use question 13 to identify insured workers and the ISCO classification for occupation categorization. For this exercise, only the first digit of the ISCO code is considered, and jobs are classified into ten categories accordingly.

# 5 - Summary Statistics for Household Income and Education

Generate a summary table displaying the minimum, maximum, mean, and standard deviation of household income, the education level of the head of household, and household size, categorized by province and urban/rural areas.

# 6 - Expenditure Deciles for Each Household

Determine the expenditure deciles for each household. Merge the food and non-food expenditure data from the summary file with the main dataset. Household expenditure is defined as the sum of food and non-food expenditures. The 'quantile' function can be used for this task.

# 7 - Histogram of Average Educational Expenditure by Expenditure Deciles

Create a histogram illustrating the average educational expenditure for the entire family per expenditure decile, categorized by urban and rural areas.

# 8 - Educational Expenditure per Child by Household Expenditure Decile

Plot a histogram showing, by urban and rural areas, what percentage of household income in each expenditure decile is spent on the education of each child currently attending school or university, on average. (assuming that all household education expenses are spent on the education of their children).