In this part of the econometric study, we will use the equation of exchange to identify the reasons of the price level changes. The equation of exchange expresses the relationship among nominal money supply, $M$, the aggregate price level, $P$ and the real output, $Y$: $MV = PY$. $V$ is the velocity of money. To move from price to price level changes or inflation, we have to change the equation of exchange as

$$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta Y}{Y} + \frac{\Delta P}{P}$$

or

$$\frac{M_t - M_{t-1}}{M_{t-1}} + \frac{V_t - V_{t-1}}{V_{t-1}} = \frac{Y_t - Y_{t-1}}{Y_{t-1}} + \frac{P_t - P_{t-1}}{\pi}$$

where $\pi$ denotes inflation (percentage change in price levels). Rearranging the terms, inflation equals to

$$\pi = \frac{M_t - M_{t-1}}{M_{t-1}} + \frac{V_t - V_{t-1}}{V_{t-1}} - \frac{Y_t - Y_{t-1}}{Y_{t-1}}.$$

So in your second project:

(1) You will test whether this model explains the price changes in Turkey during first quarter (Q1) of 1993 to fourth quarter (Q4) of 2003:

$$\pi_t = \alpha_0 + \alpha_1 \frac{\ln M_t - \ln M_{t-1}}{\ln M_{t-1}} + \alpha_2 \frac{\ln Y_t - \ln Y_{t-1}}{\ln Y_{t-1}} + \text{error}.$$ 

where $\alpha_0$, $\alpha_1$, $\alpha_2$ and $\alpha_3$ are the parameters of the model and inflation is defined as $\pi = (\ln P_t - \ln P_{t-1})/(\ln P_{t-1})$. The data is quarterly (üç aylik). Thus $P$ is quarterly consumer price index (CPI base year=1987), $M$ is quarterly M1 (use the “Monetary Aggregates (Weekly Friday)”), and $Y$ is quarterly GNP (GSMH, base year=1987). These are downloadable from www.tcmb.gov.tr.

(2) Write a report on your findings. No more than 2 pages excluding the data and graphics.