Assignment: You have a set of seven quarterly series for the country you are analyzing and four EViews program to estimate the trend of domestic GDP using alternative techniques.

The series and programs: Seven series used in the forecasting model and introduced earlier (see the Excel file data.csv: gdp, cpi, s, rn, x_gdp, x_cpi_u, and x_rn). Four programs to be run sequentially: *makedata.prg*, *kalman_step1.prg*, *kalman_step2.prg*, and *kalman_step3.prg*. Before running the programs, open the program files [Start Eviews → Open → Program → makedata.prg], and spend a few minutes understanding what each program is designed to do. Make sure that the Excel file with your data is closed when you run the programs.

Instructions:

1. Before you run the programs you must specify the program 'path' according to you structure of folders. See the second line of all program codes: `%path = "c:\mpa\W7"` and adjust the path in apostrophes accordingly.
2. Run *makedata.prg* [Click on the button "Run" or write 'run makedata' in the EViews command window → Enter]. Note that this program generates an EViews file *kalman.wf1*, which serves as a database for the other programs.
3. Go to the *kalman_step1.prg* program. Before you run the program, you need to calibrate the coefficient describing output persistence, lgdp_gap(-1); coefficient of the output trend drift; and two variances. Go to the following lines in the section labeled '--- Adds state equations to the state-space object:
    a. `kalman.append @state lgdp_gap = x*lgdp_gap(-1) + [var = z]`
    b. `kalman.append @state lgdp_tnd = lgdp_tnd(-1) + x/4 + [var = z]`

    and fill in numbers instead of 'x' and 'z'. What economic intuition guides you in calibrating the 'x' and 'z' parameters? Hint: Check L-11.
    Run the *kalman_step1.prg* program and check the results. Explore the sensitivity of your results to alternative calibrations of 'x' and 'z' parameters. **When asked by EViews do not save any changes to the *kalman.wf1* file! If you accidentally save the file, delete it and re-run *makedata.prg*.**
    Suggestion: save the series of `lgdp_gap` for future analysis in a new Excel file.
4. Go to the *kalman_step2.prg* program. You need to calibrate a few more parameters. Go to the lines:
    a. `kalman.append @state dl_cpi_x = 0.5*dl_cpi_x(-1) + (1-0.5)*dl_cpi_tar + x*lgdp_gap(-1) + [var = z]`
    b. `kalman.append @state lgdp_gap = x*lgdp_gap(-1) + [var = z]`
    c. `kalman.append @state lgdp_tnd = lgdp_tnd(-1) + x/4 + [var = z]`

    and fill in numbers instead of 'x' and 'z'. How would you calibrate 'x' and 'z' parameters in the Phillips curve (a) given the calibration of 'x' and 'z' from the previous step?
    Run the *kalman_step2.prg* program and check the results. Explore the sensitivity of your results to alternative calibrations of 'x' and 'z' parameters. **When asked by EViews do not save any changes to the *kalman.wf1* file!**
    Suggestion: add the series of `lgdp_gap` from this step to the Excel file for future analysis.
5. Go to the *kalman_step3.prg* program. Again, you need to decide a few more calibrations, following the previous steps. Run the *kalman_step3.prg* program and

check the results once your calibrations are done. **When asked by EViews do not save any changes to the *kalman.wf1* file!**
Suggestion: add the series of lgdp_gap from this step to the Excel file for future analysis.

6. Compare the estimates of the output gap using the Hodrick-Prescott filter and alternative versions of the Kalman filter.

Your output: Prepare a short presentation (6 slides maximum) in which you discuss these estimates and how they differ from each other. Did you obtain additional insights from the more complicated specifications of the filter? Groups will assemble in the lecture room and each will present findings for their respective countries.