EXERCISE 4
This exercise will extend the previous two, both in terms of the data coverage and the techniques used.

Part 1

A Microfit file named CONS95.FIT contains the data.

Run Microfit and access this file.

The data consist of:
CE: Consumers Expenditure in current prices
RCE: Consumers Expenditure in 1995 prices
RDE: Expenditure on Durables in 1995 prices
PDI: Personal Disposable Income in current prices
RPDI: Real Personal Disposable Income in 1995 prices
C: A variable with the value one for each observation

When you have read in the data, check the data definitions using TITLE.
Then:
Explain what RPDI measures and how it differs from personal income.
Plot RCE and RPDI and comment on the main features

Generate:
S=log((PDI-CE)/PDI)
RS=log((RPDI-RCE)/RPDI)
Plot these two series and comment on their meaning and the difference between them.

Generate:
LC=log(RCE-RDE)
GC=LC-LC(-1)
LY=log(RPDI)
GY=LY-LY(-1)
LP=log(CE/RCE)
GP=LP-LP(-1)
Z=LC-LY
What do these series measure?

Use the following commands and explain the output you get:
PLOT LC LY
PLOT GC GY
COR LC
COR LC LY GC GY
LIST C LC LY GC GY
XPLOT LC LY

Run a regression with RCE as the dependent variable and C and RPDI as the independent variables, **using sample 1950 to 1980.** Note and interpret the regression results.

Save your dataset in a special Microfit file with a different name to the original (eg consnew.fit). Use this file from now on.

Part 2

Run the following regressions using OLS, on **sample 1950 1980**, the first variable is the dependent variable, the rest the independent ones. In each case interpret and comment on the main features of the regression results, diagnostic tests A to D, the plot of actual and predicted values and the plot of the residuals.

1. LC C LY

Test whether the coefficient of LY is significantly different from zero and then from one, at the 5% level.

2. GC C GY

After estimating the equation go to the hypothesis testing menu and conduct a variable addition test to see whether LC(-1) and LY(-1) are jointly significant using the F statistic and individually significant using the t statistics

3. GC C GY GP

Repeat as for 2 and comment on the significance of the lagged values.

4. LC C LY LY(-1) LC(-1)

5. GC C GY LY(-1) LC(-1)

Compare the results for 4 and 5 in terms of coefficients, standard errors, log-likelihoods, and the sum of squared residuals. What is the relationship between them.

6. GC C GY LY LY(-1) LC(-1)

Explain what happens when LY is added to 5

7. GC C GY LY(-1) GP LP(-1) LC(-1)

Calculate the long run elasticities of consumption with respect to the price level and income. What does economic theory predict about the coefficient of LP(-1). Test this prediction.

8. GC C GY GP Z(-1)

Test 8 against 7. Is this a well specified equation. Explain the economic interpretation of 8. What is the long run elasticity of consumption with respect to prices and incomes in this model.

9. GC C

Interpret this model and carry out a variable addition test for the significance of LY(-1) and GY(-1). Interpret the result.

Part 3

1. Run equation 8 for the samples 1950 to 1965 and 1966 to 1980. Test whether the variances are equal in the two periods and whether the coefficients are equal.

2. Use the equation to forecast 1980 to 1985. Interpret your results.

3. Estimate equation 8 for 1980 to 1985. Note the results.

4. Construct dummy variables for 1986, 1987, 1988 and 1989 using the following commands:

```
SAMPLE 1948 1989
D86=0
D87=0
D88=0
D89=0
SAMPLE 1986 1986
D86=1
SAMPLE 1987 1987
D87=1
SAMPLE 1988 1988
D88=1
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```
SAMPLE 1989 1989
D89=1
SAMPLE 1948 1989
```

5. Run the following regression for 1950 to 1989: GC C GY GP Z(-1) D86 D87 D88 D89

6. Compare the results from this equation with the ones obtained when equation 8 was run over 1950 to 1985. Interpret the coefficients and standard errors of the dummy variables.

Part 4

1. Reestimate equation 1 assuming AR(1) disturbances, test this against 3, using a likelihood ratio test.

    a. What problems arise in testing 4 against 8?
    b. Which of the models you have estimated are restricted versions of 7?
    c. What are the restrictions in each case?

2. Construct a tree showing the relationship between this family of models and the test statistics.

3. Re-estimate equation 8 using the instrumental variable estimator, using as instruments: C LY(-1) LC(-1) LP(-1) LY(-2) LC(-2) LP(-2)

Part 5

Using the whole data set 1948 1998:

1. Use the general to specific methodology to find the best parsimonious consumption function.

2. Using DF and ADF tests investigate the time series properties of the series and whether they are cointegrated. If you find they are estimate the error correction model.

3. Use the Johansen procedure to investigate the consumption function relationship and the dynamics.

4. Compare the results from the different methods and discuss any differences.

Part 6

1. Compare the results for each of the samples used above and discuss the differences.
2. Undertake tests for structural stability across the subsamples.

3. Investigate the evolution of the coefficients using CUSUM squared procedure

4. Discuss the results, their implications for the study of consumption and possible ways to move forward.