

Doing Economics with the Computer

Lecture 3: SOLUTIONS

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Introduction to Matlab: Functions

The objective of this exercise is to show you how you can write functions. Important note: you have to code functions in a separate m-File.

Compulsory Readings

Read chapter 6 in Attaway (2019). The book is provided on Ilias.

Further Exercises

Practice by going through the practice questions in chapter 6 in Attaway (2019). Solutions to the practice questions are available on Ilias.

Housekeeping

When you write a script, you should include these commands at the start.

```
clear all % Deletes memory
close all % closes open windows (figures etc.)
clc       % clears command window
```

1 General Form

The general form of a function file is as follows: Right-click in 'Current Folder', New File, Function

In Class Exercise 1

Consider the geometric series $x(n) = q^{n-1}, n = 1, 2, \dots$. Compute the sum $s(n) = 1 + q + q^2 + q^3 + \dots + q^{n-1}$ for $q = 0.5$ and $n = 10$ using a function. Create a function file, sgs.m, that contains the function below. To produce the result call the function by typing: ssum= sgs(0.5, 10).

```
ssum= sgs(0.5, 10)
```

In Class Exercise 2

Write a function that computes the hypotenuse and the sum of the sides of a right angled triangle. Let the two sides be 4 and 5 respectively Create a function file, hypo.m, that contains the below function. To produce the result call the function [h,s] = hypo(4,5).

```
[h,s] = hypo(4,5)
```

In Class Exercise 3

Write a function that computes the hypotenuse and the sum of the sides of a right angled triangle with sides 4 and 5 as in exercise 2 above but now have one function call another, i.e.: Write a function that computes the hypotenuse and calls the function summy that computes the sum of the sides. Get the objects of interest by inputting at the command prompt: `[h,s]=hyposum(4,5)`.

```
[h,s] = hyposum(4,5)
```

Time permitting, In Class Exercise 4

The function `hdss.m` solves for the steady state values of capital and consumption in the standard economic growth model. Note that the function is written as `f(x)=0`. In order to solve this problem define the parameter values: `alpha=0.35; beta=0.99; delta=0.025; A=1; param = [alpha;beta;delta;A]`; Give initial guess of `k` and `c`, `k0`, `c0`: `k0 = 10; c0 = 1; x0 = [k0;c0]`; Then call the non-linear solver `fcsolve` to solve the system of the two non-linear equations as: `x = fcsolve('hdss',x0,[],param);`.

```
alpha=0.35;
beta=0.99;
delta=0.025;
A=1;
param=[alpha; beta; delta; A];

k0=10;
c0=1;
x0=[k0; c0];

z = hdss(x0,param);
x = fcsolve('hdss',x0,[],param);
```