

Introduction to Programming 2017-2018

Exercise 5

Question 1

Shoshana runs dogs' rescue center, where she keeps dogs that were lost or abandoned, in hope to find a new home for them. Shoshana wants to open a web-site where she would post a list of all the dogs that are in her center, containing details of each of the dogs awaiting for a new home. The list should consist of the following details: name of the dog, breed, age of the dog, dog's color and the number of the dog's identification chip.

The function '**dogData**' creates variables that contain the relevant data about the dogs, and you have to put them together into a structure. The function '*dogData*' returns 6 output arguments (in this order): (1) the number of dogs (scalar), (2) cell array of strings containing names of dogs, (3) cell array of strings containing breed of dogs, (4) vector of scalars containing age of dogs, (5) cell array of strings containing color of dogs, (6) vector of scalars containing identification chip numbers.

Write a function called '**dogCenter**' with no input arguments and one output argument (a structure array containing the dogs' data). In this function do the following:

- a. Run the ***dogData*** function and get its output variables.
- b. Create a structure array with the following field names (in this order): 'name', 'breed', 'age', 'color', 'chipNum'.

Fill in the details of the dogs (which are given by the '*dogData*' function) into this structure array, each dog should be represented by one structure in this array (therefore the size of this structure array should be equal to the number of dogs). Note: In the structure array the values in the fields 'name', 'breed' and 'color' should be strings, and the values in the fields 'age' and 'chipNum' should be scalars.

This structure array should be returned as the output argument of your '**dogCenter**' function.

Question 2

Write a function called **weightRes**. This function processes data about the weights of people that participated in an experiment, and belong either to the control or the experiment group.

The function should get one input argument: a structures array, in which each structure contains the data of one subject. This structures array has the following fields:

- **id**: a scalar, unique identifier of each subject.
- **group**: can be either the string 'ctrl' or 'exp', that signifies to which group the subject belongs.
- **kgPre**: the weight (a scalar) of the subject at the beginning of the experiment.
- **kgPost**: the weight (a scalar) of the subject at the end of the experiment.

Your function should return one output argument: a **cell array** of **size 2x3**, in which each row contains the data of one of the groups (control or experiment group), according to the following:

- i. First column: a string ('ctrl' or 'exp') noting the group whose data appears in this row.
- ii. Second column: a vector of the *id* numbers of all subjects belonging to the respective group.
- iii. Third column: a scalar – the mean (average) weight (number of kg) that the subjects lost during the experiment in the respective group.

Notes:

- In order to check your function, create several structure arrays as an input argument. You **don't have** to send/print them. Attached is the file 'exampleStruct.mat', in which you'll find an example of a structure array for the input argument. Note: a different structure array will be used in the checking process of your function.
- You can assume that the structures array in the input will be arranged in a vector form. i.e., a 1xN or Nx1 structure array.
- You may use the built-in MATLAB function 'mean' to calculate the average weight loss of the subjects during the experiment. Use the MATLAB helpdesk for syntax and usage.

General notes:

1. Submission date:

Soft copy should be submitted by **Monday (18.12.17) / Wednesday (20.12.17)** (according to your tirgul group) - **24:00**.

Hard copy should be submitted in the Tirgul group.

Good luck!