# MATLAB Assignment 5

Spring 2018, Section C

In this homework, we will go through a few advanced data structures in MATLAB, such as structures, classes, chars, as well as file input and output in MATLAB. You would be importing in the fisheriris dataset and encapsulating it in classes. After obtaining all the data, you would be required to write some funtions for the class you just created. It is advised that after each stage, you save your variables, say, all your kickstarter instances, into a .mat file such that you would not need recreate all the classes again. Please send the homework to so@cooper.edu by February 28th, 2018 . Also note that some operations will require you to do some research (such as trimming trailing white spaces and looking up the fisheriris dataset)

(a) Load in the fisheriris dataset with the command load fisheriris . You should obtain a $150 \times 4$ matrix called meas and $150 \times 1$ cell array called species in your workspace. To find out what each column in the meas matrix stand for, you need to go online and do some research. It is a very popular dataset and the meaning of each column should not be hard to find.

(b) Create a class called *Flower*. In your *Flower* class, you should have the following properties – petalWidth (double), petalLength(double), sepalWidth(double), sepalLength(double) and species(char). The ith species corresponds to the ith row of information in meas. Note that you do not need to specify the data type of the properties when you are declaring a class the following properties are just here to impress on you what type of properties you would be expecting.

(c) Create a constructor for Flower that will take in four doubles and one char array for the 4 measurements and class respectively.

(d) Now, import the entries from meas and species the into MATLAB and store it in a cell array of Flower instances. You can either use a for loop to import the entries, or use a more elegant way to make all entries in one line (this would require some research on object formation in matlab). Either way will be fine for this task. However, note that the name of the species are stored as cell arrays, make sure to **extract** from the cell as a char and **remove trailing white spaces** before storing them in the *Flower* instances.

(e) Create a method called *getSLength* for the Flowers object, which will return the sepal length of the object. Test it and make sure it works.

(f) Create another method called *report* for the Flowers object, which will print out a statement on the command window and report the details about the Flowers object. This function does not need to return anything. If the flower is 5.1cm in sepal length, 3.5cm in sepal width, 1.4cm in petal length and 0.2cm in petalWidth, and the species is setosa, print out the following statement:

"The length and width of its sepal are 5.1cm and 3.5cm respectively, while that of its petal are 1.4cm and 0.2cm respectively. It belongs to the setosa class."