**BE2080 Week#8**

**Please submit your Matlab programs (.m file and .fig file if applicable). Please name your files clearly, for example, Wk8\_Q1.m. Please check and make sure all your files are submitted.**

1) (10 points) The attached data file ‘department.dat’ has some college department names and enrollments in format like this:

**Aerospace 90**

**Civil 176**

**Mechanical 254**

**……..**

Write an Matlab function that will: (1) read every line from this file, (2) add a line index at the beginning of each line (e.g. Department #1), and (3) save the new lines to a new file. The function should have no output argument and two input arguments: the original file path, and the file path for the new file. The content of the new file must look like:

**Department #1: Aerospace 90**

**Department #2: Mechanical 254**

**Department #3: Civil 176**

………

2) (10 points) The data file “TestRecords.txt” contains two measurements (Meas#1 and Meas#2) from some patients. The data part of the file is organized in the following way:

ID Name Meas#1 Meas#2

123 Donald Bird 120.1 78.2

342 George Aaron 111.1 70.3

….….

Open the data file and understand the content and format of this data file. Then write a function to extract the Meas#1 and Meas#2 from all patients, and calculate the mean values of Meas#1 and Meas#2. The function shall have one input argument which is the file path of the data file; and it should have two output arguments which are the mean of Meas#1 and Meas#2 from all patients. As an example, the function should run like this:

>>[MV1, MV2] = CalMeans(‘TestRecords.txt’);

MV1 =

117.7750

MV2 =

73.4500

3) (10 points) The data file ‘TestBin.dat’ stores a sequence of numbers in binary in format uint8. Write a function to read such data. The function should have: (1) one input argument which is the file path of the data file, and (2) two output arguments, the first is the number of elements in the data file and the second is the mean of all elements in the data file. As an example, the function should run like this:

>> [Num, Avg]=ReadBin('TestBin.dat')

Num =

200

Avg =

126.9300

4) (20 points) The data file “TempRecords.txt” stores average monthly temperature measured from location (identified using a zipcode). The records may be missing in some months, in which case, it is labeled as “NaN” in the data file.

Open the data file and understand its content and format. Then write a function that will extract the zipcode and temperature data, all in numeric format and as the two output- arguments of the function. The function has one input argument which is the file path of the data file. As an example, the function should run like this:

>> [ZIP,DATA] = ReadTemp("TempRecords.txt")

ZIP =

65211

DATA =

33 37 42 NaN 53 72 NaN 79 66 55 46 41

Please note that the missing temperatures are outputted as NaN.

Then adapt this function in a GUI App as shown below. The App has a Menu named “Open Data”. When clicking this menu, a file browser is opened to choose the data file. Find the “TempRecord.txt” and click Open. The App will plot the 12-month temperature in a bar chart. It also shows the zipcode and the number of months with missing temperatures.

