CS 1173: Vector indexing (HW5) Fall 2012

Fasting blood sugar (FBS) is a test to measure the amount of glucose in the blood after a 12 hour fast. Values under 100 mg/dl are considered normal. Values between 100 mg/dl and 126 mg/dl indicate a pre-diabetic condition. The following data set measured

Variable name	Contents
FBS	An array containing fasting blood sugar measurements in units of mg/dl (milligrams/deciliter). Each row represents a patient and each column represents a measurement.
gender	A column vector with an entry for each row of FBS. The entry is `'male'` for those patients that are men and `'female'` for those patients who are women.
age	A column vector with an entry for each row of FBS. The entry contains the age of the corresponding patient.
raceEthnicity	A column vector with an entry for each row of FBS. The entry contains the race/ethnicity of the corresponding patient. The entries are `'B'` for non-Hispanic black, `'W'` for non-Hispanic white, `'H'` for Hispanic, `'O'` for other.
lab	A row vector with an entry for each column of FBS. The entry contains the number of the laboratory that took the measurements in the corresponding column. The entries are `1`, `2`, or `3` corresponding to laboratories 1, 2, and 3, respectively.
diagnosis	An array of the same size as FBS. The entry contains a `1` if the corresponding measurement was taken after the patient had been diagnosed with diabetes or `0` otherwise.

1. Suppose there are 100 patients and each patient has 20 tests. Draw a picture of the FBS array and the gender vector. Indicate the size and meaning of the rows and columns of the two variables. Also state the correspondence between the two variables.

2. Write MATLAB code to find the total number `FBS` measurements that were normal.

3. Write MATLAB code to find the number of women in the cohort.

4. Write MATLAB code to find the number of measurements made by laboratory 1.

5. Write MATLAB code to find the number of Hispanic men in the study.

6. Write MATLAB code to find the number of white men who are 50 and over in the study.

7. Write MATLAB code to extract an array containing only the FBSs from laboratory 2.

8. Write MATLAB code to extract an array containing only the FBSs from women patients between ages of 45 and 65 (inclusive).

9. Write MATLAB code to find the maximum FBS measurement that occurred in patients under the age of 65.

10. Write MATLAB code to find the number of patients who had at least one FBS measurement above the normal range, but had no measurements above the pre-diabetic range.