Lab. 5 Structure Arrays; Input/Output to Text Files

Do the exercises below in the Octave IDE. Make sure the files and the programs are in the same working directory.

1. Input a Structure Array

Specify function with signature

```
function S = read_structure_array(fname)
```

that returns a structure arrays, **S**, with the data stored in file with **`fname`**. The first line of the file indicated the name of the fields of the structure, and the separator is character "`;`". Test your function with file **`students.txt`** available in the website.

2. Process a Structure Array of Substrings

For the structure array **`s`** of the previous question write functions to answer the following question:

a) How many students have a positive grade

```
function n = n_positives(S)
```

b) Given a structured array S (as before), return a structure array B, containing the number and names of the students with grades better than a certain **`grade`**.

```
function B = best_students(S, grade)
```

c) Obtain a histogram of the grades, in a matrix H, where the first column has all values between 0 and 20, and the second the number of students with the grades rounded to the value in the first column.

```
function H = histogram(S)
```

3. Writing a Structure Array

a) Write a function that writes into the file with **fname** a structured array with a first line containing the names of the structure fields separated by ";" (the function returns **n**, the number of students written in the file).

```
function write_structure_array_students(S, fname)
```

b) Use this function to write the structured array with the best students into a file named **`best_students.txt`**.

```
function write_best_students(S)
```

c) Use again the function to write into the file **`students_x.txt`** all the students that have a name started with any letter **`x`** (beware of lower and upper cases).

```
function write_letter_students(S, letter)
```