

**COMPUTER SKILLS A.Y. 2015/16**  
**Winter 2016 final exam - 2/5/2016**  
**Part 1**

<b>Last name</b> _____	<b>First name</b> _____
<b>Student ID number</b> _____	

**Question 1**

Given a Matlab function `f1()`, what are the techniques that can be used to inspect the value of the local variables (i.e., the variables in the local workspace of `f1`) at runtime, that is while `f1` is being executed? Provide a brief description and an example for each described technique.

**Question 2**

Explain the differences between using `for` loops and `while` loops and provide an example of code where a `for` loop is transformed into a `while` loop.

**Question 3**

Using the flow diagram notation, write an algorithm to count the occurrences of a given value in a vector. If no occurrence is found the output value is 0, as well as if the vector is empty.

*Example:* when the input vector is `[1 4 0 3 4]` and the given value is 4, then the output is 2.

**Question 4**

Describe in MATLAB how you can read and write data from and to a file, providing some example of code.

**Question 5**

Consider the strings `'Hello'` and `'Goodbye'` and let us suppose we want to create the following vector:

M=

H	e	l	l	o		
G	o	o	d	b	y	E

Describe all the methods we have studied to create M by concatenating strings of different sizes.

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**Part 2**

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**Exercise 1**

Write in MATLAB a function that takes in input a matrix  $M$  of integer elements, checks if the matrix is non empty and returns as output value the number of even elements of the matrix. If the matrix is empty, the output value is 0.

Example: if  $M = \begin{bmatrix} 2 & 3 & 4 \\ 1 & 7 & 2 \\ 5 & 3 & 8 \end{bmatrix}$  then the output is 4.