**Fingerprint Biometrics Lab - Report**

FIRST NAME, LAST NAME

Based on the provided code, complete the following document.

1.a) Copy here the two fingerprint images provided as examples (example1\_1 and example1\_2):

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1.b) How many macro-singularities do you observe in each fingerprint?

1.c) Mark the macro-singularities in the images (deltas and loops).

2.a) Execute the provided code for **Fingerprint Enhancement** and paste the resulting image here:

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2.b) What differences do you observe with respect to the original fingerprints?

3.a) Execute now the code for **Quality Maps**, and past the resulting quality maps:

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3.b) What is the range of values for these quality maps?

3.c) What kind information (apart from the quality) can be inferred from such code?

4. Execute the code in order to show the **Binarized Fingerprint and the Segmented Fingerprint**. Apply different values of quality *threshold* (0.1, 0.3, 0.6, 0.9) and paste here the resulting images:

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5.a) Execute the code for generating the **Fingerprint Skeleton** and the **Minutiae Extractor**. Paste the resulting images for the original values *window=5* and *margin=5*.

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5.b) Search heuristically by looking at the images for the optimal values of parameters *window* and *margin*. Paste the resulting images with your optimal parameters and justify your decision.

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6.a) Execute the code corresponding to the **Minutiae Validation** for *window*=5 and *margin*=5. Paste the resulting image including the minutiae extracted (red crosses) and validated (blue circles) of both fingerprints.

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6.b) Execute the same code but with the optimal values of parameters *window* and *margin*. Paste the resulting image below.

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6.c) Do you think it is a good idea to include the **Minutiae Validation** module? Justify your opinion.

**With all the previous exercises done correctly you can obtain a mark up to 7 points out of 10.**

**Extra work:** If you want to obtain a mark up to **10 points out of 10** you should complete the following:

In folder “/ddbb” you have 20 fingerprint images. 19 of them are labeled with the subject identity (e.g., H0001), and 1 is Unknown. Search for the identity of the Unknown fingerprint in the set of 19 labelled reference fingerprints. You can use the provided code “identification\_1\_19.m” as basis. Paste here the resulting ranked list of scores of the Unknown fingerprint with respect each one of the 19 reference fingerprints.