

1)
a)
left loop
tented arch
right loop
whorl
left loop
left loop
whorl

2)
T =

21×5 table

| FirstFP | SecondFP | DeltaTheta | DeltaX | DeltaY |
|---------|----------|------------|--------|--------|
| "FP1" | "FP2" | 140 | -30 | 270 |
| "FP1" | "FP3" | 20 | 60 | 330 |
| "FP1" | "FP4" | -150 | 420 | 210 |
| "FP1" | "FP5" | 0 | -60 | -30 |
| "FP1" | "FP6" | 0 | 0 | 0 |
| "FP1" | "FP7" | -140 | 330 | -30 |
| "FP2" | "FP3" | -20 | 480 | 90 |
| "FP2" | "FP4" | 60 | 60 | -30 |
| "FP2" | "FP5" | -10 | 270 | -60 |
| "FP2" | "FP6" | 0 | -90 | 0 |
| "FP2" | "FP7" | -250 | -60 | 0 |
| "FP3" | "FP4" | 0 | 60 | -120 |
| "FP3" | "FP5" | 20 | 120 | 480 |
| "FP3" | "FP6" | 250 | 90 | -30 |
| "FP3" | "FP7" | -20 | 420 | 150 |
| "FP4" | "FP5" | 260 | -180 | 120 |
| "FP4" | "FP6" | 140 | -30 | 270 |
| "FP4" | "FP7" | 0 | -60 | -30 |
| "FP5" | "FP6" | 0 | 0 | 0 |
| "FP5" | "FP7" | -140 | 390 | -30 |
| "FP6" | "FP7" | 0 | 0 | -90 |

3)

The number of paired points in the table is the total number of the paired points in first fingerprint and the paired points in second fingerprint. So in the following answers the numbers are divided by 2.

T2 =

21×6 table

| FirstFP | SecondFP | Distance | Angle | PairedPoints | UnpairedPoints |
|---------|----------|----------|-------|--------------|----------------|
| "FP1" | "FP2" | 21 | 5 | 0 | 73 |
| "FP1" | "FP3" | 21 | 5 | 6 | 76 |
| "FP1" | "FP4" | 21 | 5 | 0 | 85 |
| "FP1" | "FP5" | 21 | 5 | 8 | 56 |
| "FP1" | "FP6" | 21 | 5 | 38 | 47 |
| "FP1" | "FP7" | 21 | 5 | 2 | 80 |
| "FP2" | "FP3" | 21 | 5 | 0 | 73 |
| "FP2" | "FP4" | 21 | 5 | 0 | 76 |
| "FP2" | "FP5" | 21 | 5 | 0 | 55 |
| "FP2" | "FP6" | 21 | 5 | 6 | 70 |
| "FP2" | "FP7" | 21 | 5 | 0 | 73 |
| "FP3" | "FP4" | 21 | 5 | 8 | 77 |
| "FP3" | "FP5" | 21 | 5 | 0 | 64 |
| "FP3" | "FP6" | 21 | 5 | 0 | 85 |
| "FP3" | "FP7" | 21 | 5 | 0 | 82 |
| "FP4" | "FP5" | 21 | 5 | 0 | 67 |
| "FP4" | "FP6" | 21 | 5 | 2 | 86 |
| "FP4" | "FP7" | 21 | 5 | 42 | 43 |
| "FP5" | "FP6" | 21 | 5 | 6 | 61 |
| "FP5" | "FP7" | 21 | 5 | 0 | 64 |
| "FP6" | "FP7" | 21 | 5 | 10 | 75 |

Average number of minutiae points paired: 3.048.

I choose the threshold parameters based on the width of bins in alignment. The size of images are 300×300 and theta is more influential than x and y, so I set the width as 10, 30 and 30. The delta x, y and theta are counted in bins so there will be some error due to it. So I choose the parameter based on:

$$10/2=5, \text{sqrt}((30/2)^2+2)=21$$

Image 1 and image 6 possibly belong to the same individual; Image 4 and image 7 possibly belong to the same individual. Because the paired minutiae points of them are 19 and 21, more than 12.