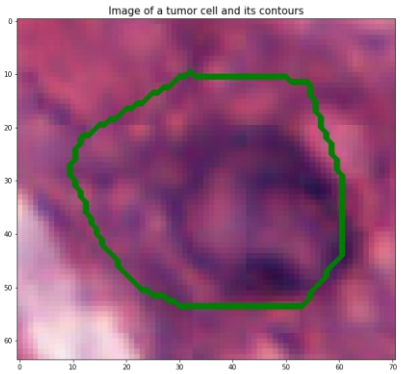
Lab 03: elements of corrections

Q2 :

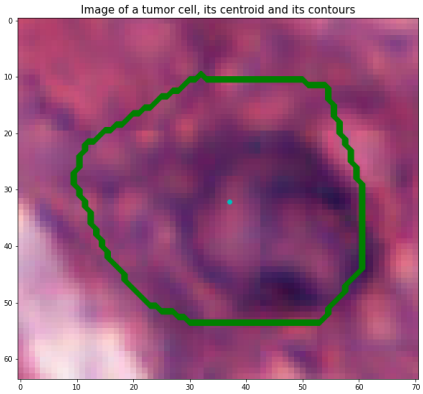


Note:

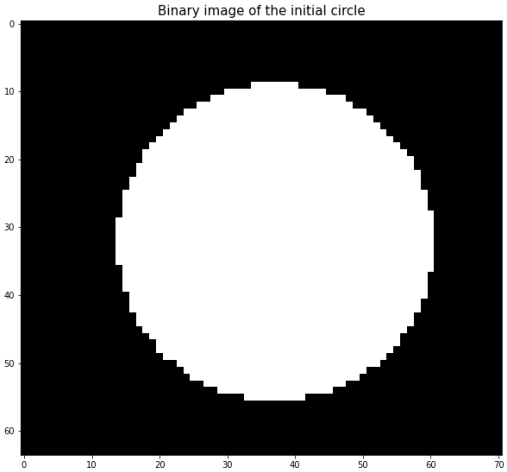
Q3 : read carefully the instructions

« For the radius, we assume that a good estimation is the centroid of the pixels belonging to the **full tumor cell (not only the perimeter) »**

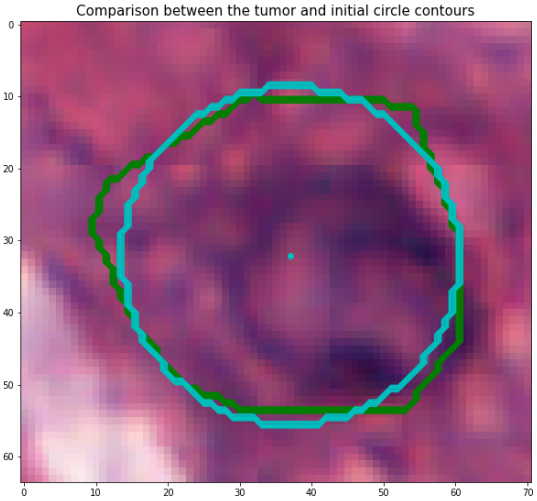
Q4 :



Q6 :



Q7 :



Q8 :

We start from the circle equation:

$$(x_i - x_c)^2 + (y_i - y_c)^2 = r^2$$

If we develop it, we obtain:

$$x_i^2 + y_i^2 = 2x_c x_i + 2y_c y_i + r^2 - x_c^2 - y_c^2$$

Thus, we have:

- $\alpha = 2x_c$
- $\beta = 2y_c$
- $\gamma = r^2 - x_c^2 - y_c^2$

Q9: you have to implement $z_i = \alpha * x_i + \beta * y_i + \gamma$

Q10:

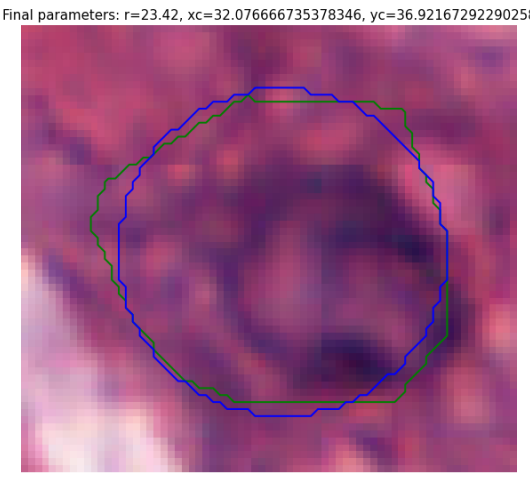
```
Initial variable values: alpha=64.257481648786, beta=74.15358554488989, gamma=-1861.5376090329207
Initial loss value: 3443.5058710670824

Final variable values: alpha=64.15333347075669, beta=73.84334584580516, gamma=-1843.545368370178
Optimized loss value: 3423.0462295713055
```

Q11:

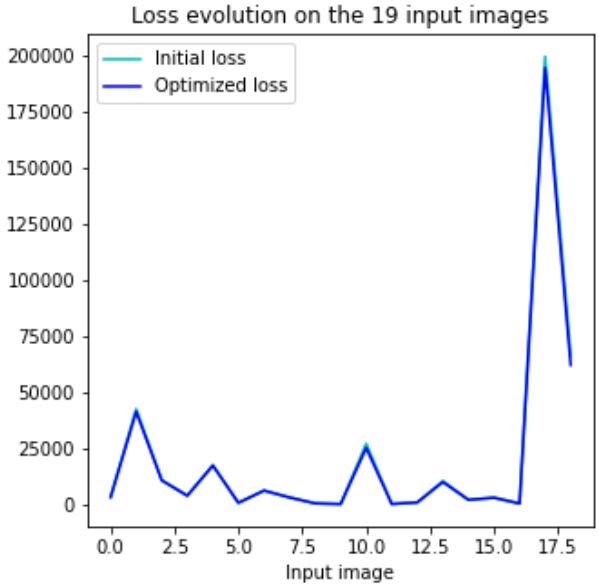
```
Initial parameter values: xc=32.128740824393, yc=37.076792772444946, r=23.35394913540154
Optimized parameter values: xc=32.076666735378346, yc=36.92167292290258, r=23.421723077266268
```

Q12:



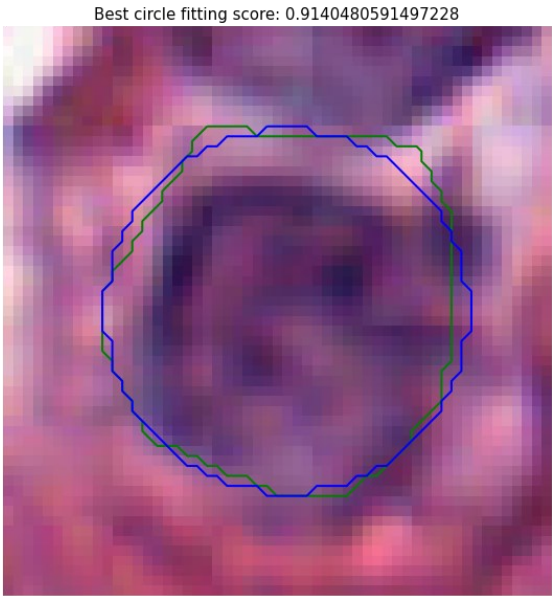
Q13: `IoU value: 0.8882289416846653`

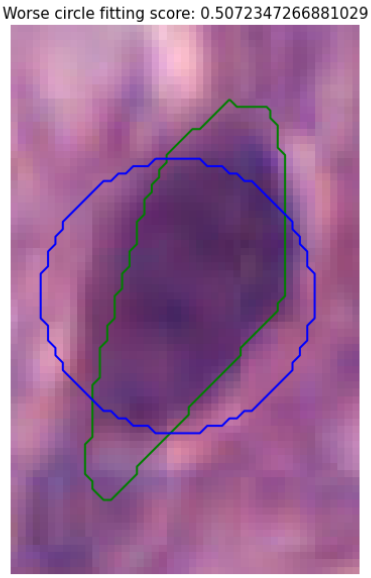
Q15:



Q16: `Optimized IoU: mean=0.7755717037098804, std=0.11460765488392512`

Q17-Q18:





Q19: