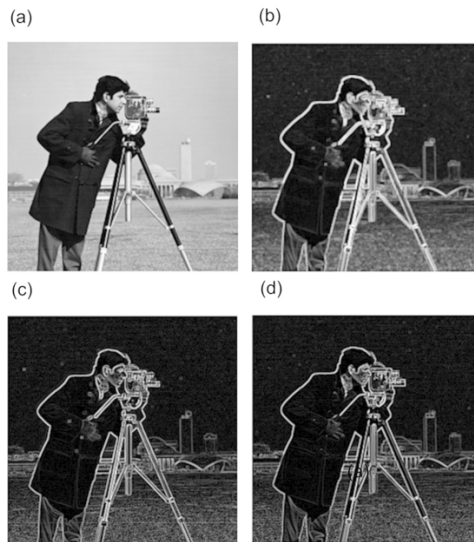1. What is the morphological gradient?

- Is the difference between the dilation and the erosion of a given image. It is an image where each pixel value (typically non-negative) indicates the contrast intensity in the close neighborhood of that pixel.


(a)   (b)
(c)   (d)

2. What is image segmentation?

- Is the process of partitioning a digital image into multiple segments (sets of pixels, also known as image objects). The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze.
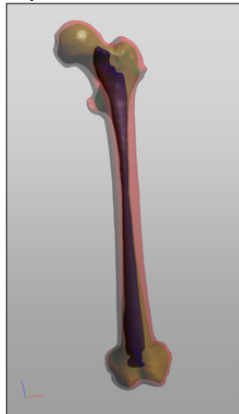
3. What types of segmentation are in images?

- There are 2 mainly segmentation types:

Semantic Segmentation   Instance Segmentation
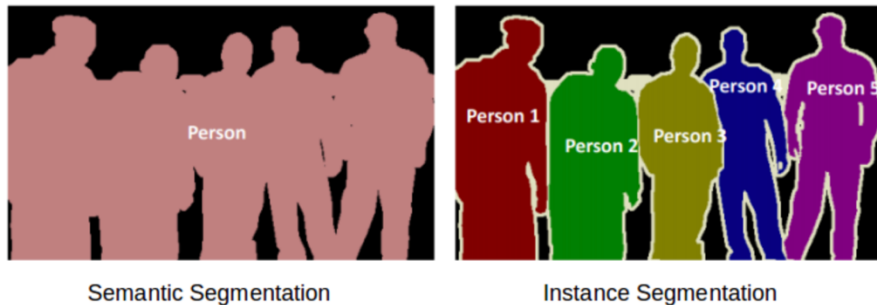
Let me quickly summarize what we've learned. If there are 5 people in an image, semantic segmentation will focus on classifying all the people as a single instance. Instance segmentation, on the other hand. will identify each of these people individually.

So far, we have delved into the theoretical concepts of image processing and segmentation. Let's mix things up a bit – we'll combine learning concepts with implementing them in Python. I strongly believe that's the best way to learn and remember any topic.

4. Mention the names of the main algorithms you found for image segmentation

- Region-based Segmentation
    - o Threshold Segmentation
    - o Regional Growth Segmentation

- Edge Detection Segmentation
    - o Sobel Operator
    - o Laplacian Operaton

- Segmentation based on clustering

- Segmentation based on weakly-supervised learning in CNN