

```
1 # Title: Programming Assignment 2
2 # Due date: Wednesday, September 9, 2021 at 11:59pm
3 # Author: Sotheanith Sok
4 # Description: Converts the grayscale image I to binary image BW, by replacing all pixels in
  the input image with luminance greater than level with the value 1 (white) and replacing all
  other pixels with the value 0 (black).
5 # -----
6 # imports
7 import numpy as np
8 from skimage import color
9
10 def im2bw(I, level):
11     """Converts image I to binary image BW, by replacing all pixels in the input image with
  luminance greater than level with the value 1 (white) and replacing all other pixels with the
  value 0 (black). If I isn't grayscale image, I will be converted to one.
12
13     Args:
14         I (array): image.
15         level (double): luminance threshold, specified as a number in the range [0, 1].
16
17     Returns:
18         [array]: binary image.
19     """
20     # Check if image should be converted to grayscale
21     if len(np.shape(I)) == 3:
22         I = color.rgb2gray(I)
23
24     # Convert a grayscale image to a binary image
25     if len(np.shape(I)) < 3:
26         I[I > level] = 1
27         I[I <= level] = 0
28     else:
29         print("Error: Image isn't grayscale")
30     return I
```