

# Solution code

INSTRUCTOR COPY: rle\_solution.py. Do not hand out before students have tried.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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1 # rle_solution.py (INSTRUCTOR COPY: do not hand out before students have tried)
2
3 import matplotlib.pyplot as plt
4 from pictures import MUG, DINOSAUR, MARIO, APPLE, LOCK, GHOST, UK_IRELAND
5
6
7 def show_picture(picture):
8     plt.imshow(picture, cmap="Greys", interpolation="nearest")
9     plt.axis("off")
10    plt.show()
11
12
13 def decode_row(clue):
14     row = []
15     colour = 0
16     for number in clue:
17         for i in range(number):
18             row.append(colour)
19             if colour == 0:
20                 colour = 1
21             else:
22                 colour = 0
23     return row
24
25
26 def decode_picture(clues):
27     picture = []
28     for clue in clues:
29         row = decode_row(clue)
30         picture.append(row)
31     return picture
```

```

33
34 def encode_row(row):
35     clue = []
36     colour = 0
37     count = 0
38     for pixel in row:
39         if pixel == colour:
40             count += 1
41         else:
42             clue.append(count)
43             colour = pixel
44             count = 1
45     clue.append(count)
46     return clue
47
48
49 print(decode_row([2, 7, 3]))
50 print(encode_row([0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0]))
51 show_picture(decode_picture(MUG))
52 show_picture(decode_picture(DINOSAUR))
53 show_picture(decode_picture(MARIO))
54 show_picture(decode_picture(APPLE))
55 show_picture(decode_picture(LOCK))
56 show_picture(decode_picture(GHOST))
57 show_picture(decode_picture(UK_IRELAND))

```