



## Image Compression with K-Means Clustering

TOTAL POINTS 7

1. K-Means clustering is a supervised learning algorithm.

1 point

- ☐ True
- ☒ False

2. You are tasked with building a model to compress images using k-means clustering. What pre-processing steps should you follow? (Check all that apply.)

1 point

- ☒ Normalize the pixels values in the image.
- ☒ Reshape the data to [n\_samples \* n\_features].
- ☒ Convert the images into numerical values.

3. For a NumPy array, **img**, of shape (600, 394, 3), will the code in both blocks below return an array of shape (236400, 3)? Why or why not?

2 points

```
1 img = img.reshape(600 * 394, 3)
2 img.shape
```

```
1 img = img.reshape(-1, 3)
2 img.shape
```

- ☐ Maybe. The shape dimension of -1 introduces randomness. The shape returned may sometimes be (3, 3), and at other times be (236400, 3).
- ☐ No. The shape dimension -1 means the rightmost shape dimension is chosen from the original array. The second code block will return an array of shape (3, 3).
- ☒ Yes. Since one shape dimension is -1, the value is inferred from the length of the array and the remaining dimensions.

4. Which of the following options allows you to define a function and interact with it in a single shot?

1 point

☒

```
1 @Interact
2 def func(a=True, b=1.0):
3     return (a, b)
```

☐

```
1 def func(a=True, b=1.0):
2     return (Interact(a), Interact(b))
```

5. In terms of computation time, is scikit-learn's implementation of [MiniBatchKMeans](#) faster, slower, or the same compared to [KMeans](#)?

1 point

- ☐ The same.
- ☒ Faster.
- ☐ Slower.

6. What is the distance metric used in the standard implementation of k-means to calculate the cluster assignments?

1 point

- ☐ Manhattan Distance.
- ☒ Euclidean Distance.
- ☐ Cosine Similarity.

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