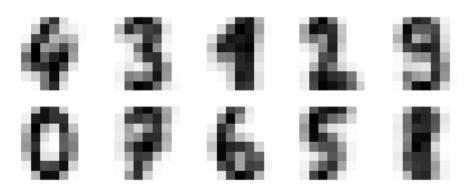```
In [ ]: #Ayush Pandey (18SCSE1010554)
         #Question no - 9

In [ ]: #Dataset link - https://scikit-learn.org/stable/modules/generated/sklea
         rn.cluster.KMeans.html

In [1]: %matplotlib inline
         import matplotlib.pyplot as plt
         import seaborn as sns; sns.set()
         import numpy as np
         from sklearn.cluster import KMeans

In [2]: from sklearn.datasets import load_digits
         digits = load_digits()
         digits.data.shape

Out[2]: (1797, 64)

In [3]: kmeans = KMeans(n_clusters = 10, random_state = 0)
         clusters = kmeans.fit_predict(digits.data)
         kmeans.cluster_centers_.shape

Out[3]: (10, 64)

In [5]: fig, ax = plt.subplots(2, 5, figsize=(8, 3))
         centers = kmeans.cluster_centers_.reshape(10, 8, 8)
         for axi, center in zip(ax.flat, centers):
             axi.set(xticks=[], yticks=[])
             axi.imshow(center, interpolation='nearest', cmap=plt.cm.binary)
```

```
In [6]:  from scipy.stats import mode
         labels = np.zeros_like(clusters)
         for i in range(10):
             mask = (clusters == i)
             labels[mask] = mode(digits.target[mask])[0]
```

```
In [7]:  from sklearn.metrics import accuracy_score
         accuracy_score(digits.target, labels)
```

Out[7]: 0.7952142459654981