

Lab 4 – Clustering

1. K-means Clustering Algorithm

Output:

```
Name: Jiya Hona  
Symbol: 29097/078
```

```
Time taken by K-means to find clusters: 0.2299 seconds
```

```
Cluster Centers:
```

```
[[25.19138195 16.26260073]  
[76.503784    75.50571115]  
[26.00032029  83.89981507]  
[75.67262805  24.59271894]  
[26.01041178  50.14803047]]
```

```
[ ]:
```

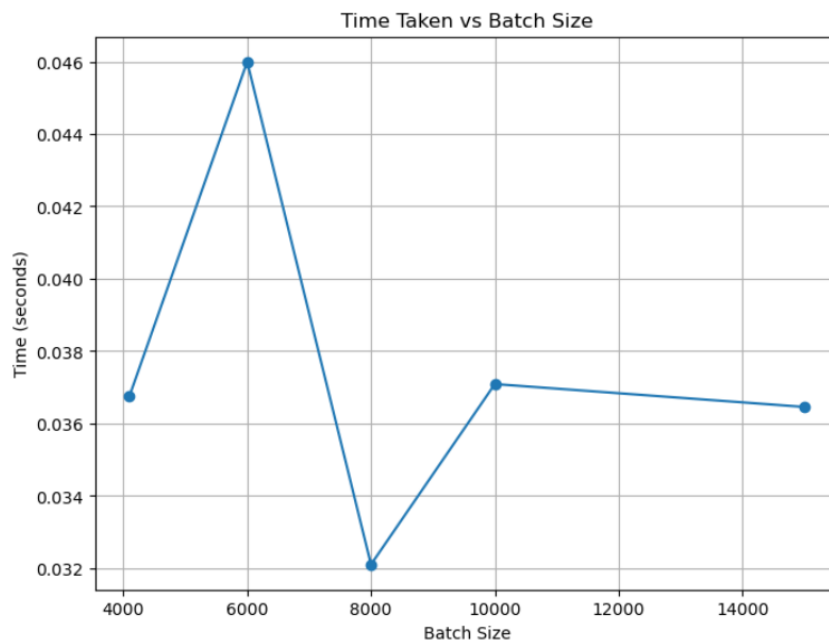
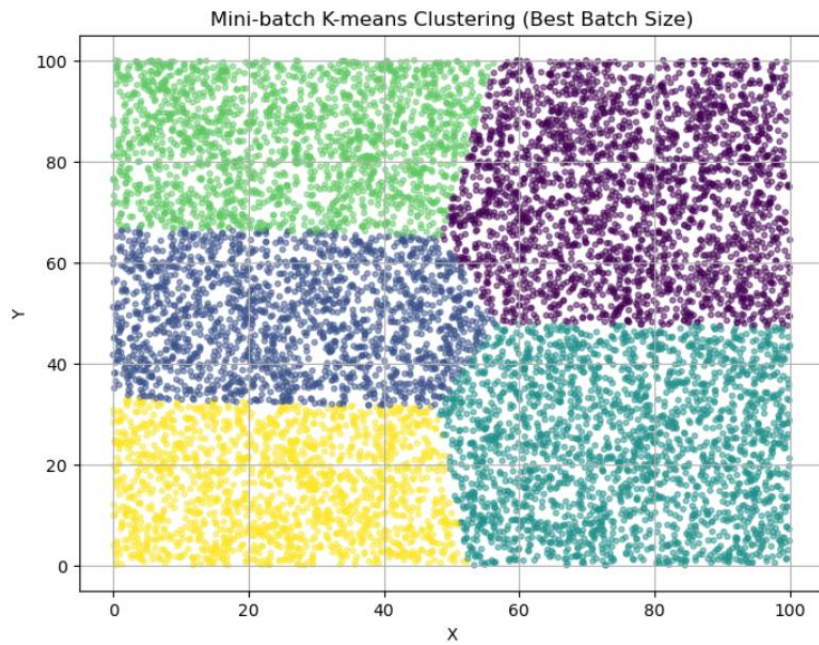
2. Mini-batch K-means Clustering

Output:

Name: Jiya Hona
Symbol: 29097/078

Time taken with batch size 4096: 0.0367 seconds
Time taken with batch size 6000: 0.0460 seconds
Time taken with batch size 8000: 0.0321 seconds
Time taken with batch size 10000: 0.0371 seconds
Time taken with batch size 15000: 0.0365 seconds

Best batch size: 8000



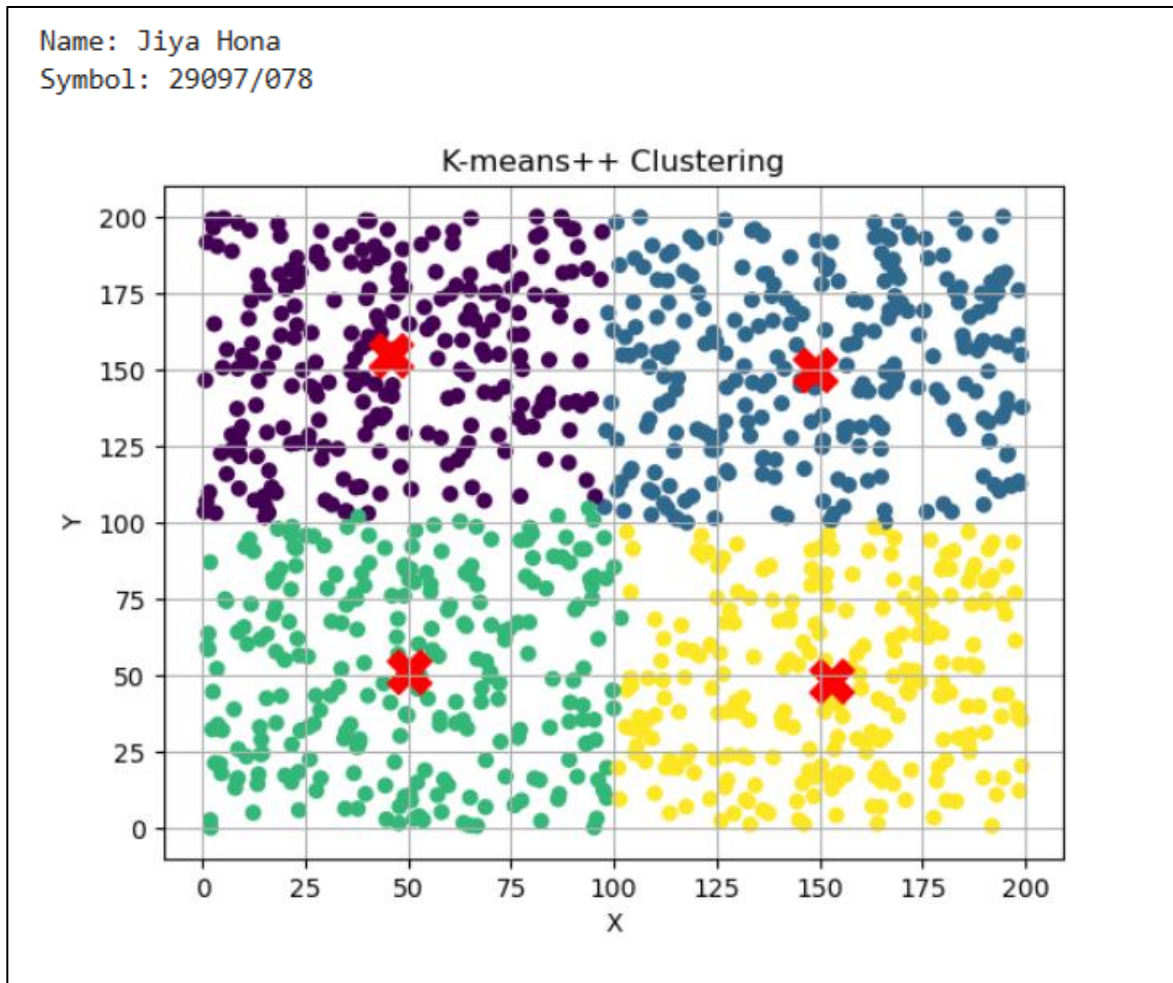
3. K-means Clustering Algorithm

Output:

```
Name: Jiya Hona  
Symbol: 29097/078  
  
Time taken by K-means to find clusters: 0.0111 seconds  
  
Cluster Centers:  
[[25.91194647 27.45654701]  
[46.31333619 78.99389581]  
[79.32395533 33.95158145]]
```

4. K-means++ Clustering

Output:

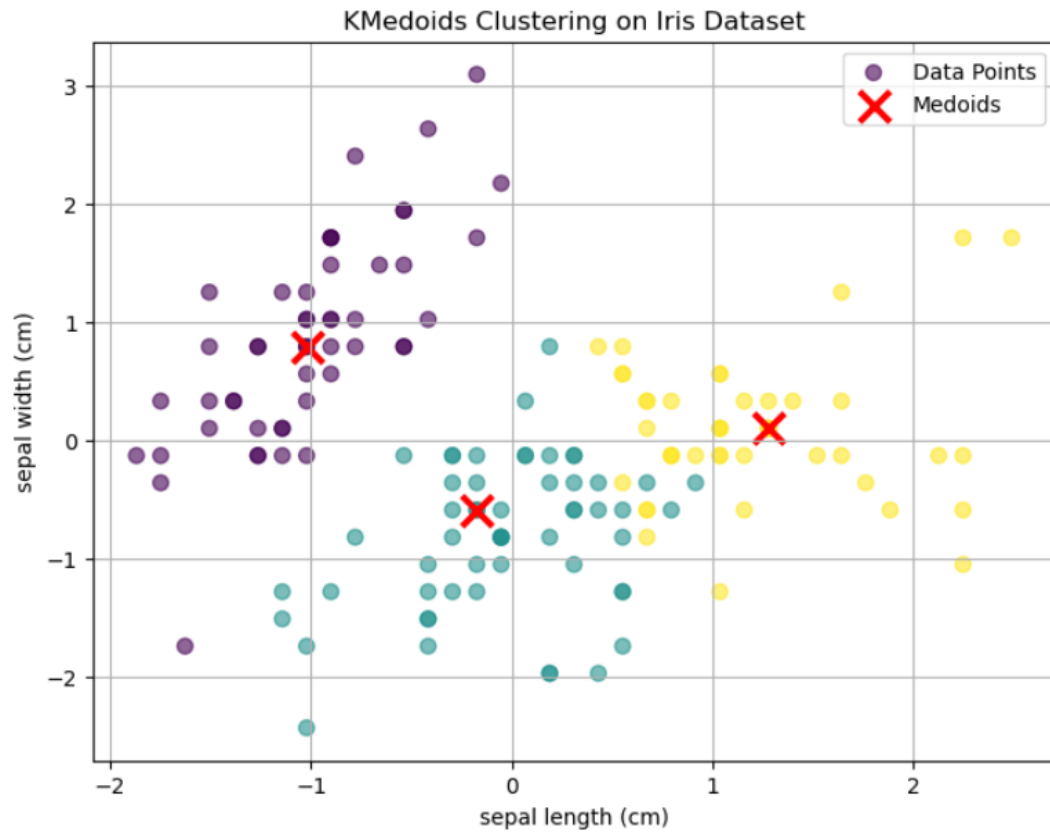


5. KMedoids

Output:

Name: Jiya Hona
Symbol: 29097/078

Silhouette Score: 0.46



6. Agglomerative

Output:

