Experiment 10

```
pip install pyclustering
```

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Collecting pyclustering
  Downloading pyclustering-0.10.1.2.tar.gz (2.6 MB)
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  Preparing metadata (setup.py) ... done
Requirement already satisfied: scipy>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from pyclustering) (1.11.4)
Requirement already satisfied: matplotlib>=3.0.0 in /usr/local/lib/python3.10/dist-packages (from pyclustering) (3.7.1)
Requirement already satisfied: numpy>=1.15.2 in /usr/local/lib/python3.10/dist-packages (from pyclustering) (1.23.5)
Requirement already satisfied: Pillow>=5.2.0 in /usr/local/lib/python3.10/dist-packages (from pyclustering) (9.4.0)
Requirement already satisfied: ccntourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (1.2.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (0.12.1)
Requirement already satisfied: fcnttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (4.45.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (1.4.5)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (23.2)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (3.1.1)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.0.0->pyclustering) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-cateutil>=2.7->matplotlib>=3.0.0->pyclustering) (1.16.0)
Building wheels for collected packages: pyclustering
  Building wheel for pyclustering (setup.py) ... done
  Created wheel for pyclustering: filename=pyclustering-0.10.1.2-py3-none-any.whl size=2395103 sha256=1d2a4bc3e444e5d7fa862ec8f5b4d413963542879b899b45997409a586734aac
  Stored in directory: /root/.cache/pip/wheels/b5/42/97/11eee99f5c1e4fdfc170f0a54f9c9eb195df65edb4cf69f449
Successfully built pyclustering
Installing collected packages: pyclustering
Successfully installed pyclustering-0.10.1.2
```

```python
from pyclustering.cluster.clarans import clarans
from pyclustering.utils import timedcall
from sklearn import datasets


iris =  datasets.load_iris();
data = iris.data

data = data.tolist()

#get a glimpse of dataset
print("A peek into the dataset : ",data[:4])

clarans_instance = clarans(data, 3, 6, 4);

#calls the clarans method 'process' to implement the algortihm
(ticks, result) = timedcall(clarans_instance.process);
print("Execution time : ", ticks, "\n");

#returns the clusters
clusters = clarans_instance.get_clusters();

#returns the mediods
medoids = clarans_instance.get_medoids();


print("Index of the points that are in a cluster : ",clusters)
print("The target class of each datapoint : ",iris.target)
print("The index of medoids that algorithm found to be best : ",medoids)
```

```
A peek into the dataset :  [[5.1, 3.5, 1.4, 0.2], [4.9, 3.0, 1.4, 0.2], [4.7, 3.2, 1.3, 0.2], [4.6, 3.1, 1.5, 0.2]]
Execution time :  2.4204435850000436

Index of the points that are in a cluster :  [[51, 53, 55, 57, 59, 60, 61, 62, 64, 66, 67, 69, 71, 73, 74, 78, 79, 80, 81, 82, 84, 85, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 106], [0
The target class of each datapoint :  [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
 2 2]
The index of medoids that algorithm found to be best :  [88, 15, 146]
```