0.06493139266967773 seconds to run KMEANS on FRUITS data set

0.043000221252441406 seconds to run KMEANS on Phones data set

0.6390061378479004 seconds to run KMEANS on FRUITS data set

0.04099464416503906 seconds to run KMEANS on Phones data set

Part_2 ----------

0.008916378021240234 seconds to run PCA transformation on Fruits database

0.004000186920166016 seconds to run PCA transformation on Phones database

0.12756013870239258 seconds to run ICA transformation on Fruits database

0.007991313934326172 seconds to run ICA transformation on Phones database

0.001008749008178711 seconds to run RP transformation on Fruits database

0.0 seconds to run RP transformation on Phones database

0.1380012035369873 seconds to run LLE transformation on Fruits database

0.6960048675537109 seconds to run LLE transformation on Phones database

Part 3

1.8999934196472168 seconds for part_3 Fruits dataset KMeans method PCA dimencity reduction method

Part 3

2.092128276824951 seconds for part_3 Fruits dataset KMeans method ICA dimencity reduction method

Part 3

1.9356229305267334 seconds for part_3 Fruits dataset KMeans method RP dimencity reduction method

Part 3

1.9109954833984375 seconds for part_3 Fruits dataset KMeans method LLE dimencity reduction method

Part 3

11.797796726226807 seconds for part_3 Fruits dataset EM method PCA dimencity reduction method

Part 3

17.577786684036255 seconds for part_3 Fruits dataset EM method ICA dimencity reduction method

Part 3

15.37781810760498 seconds for part_3 Fruits dataset EM method RP dimencity reduction method

Part 3

16.686046361923218 seconds for part_3 Fruits dataset EM method LLE dimencity reduction method

Part 3

2.978252649307251 seconds for part_3 Phones dataset KMeans method PCA dimencity reduction method

Part 3

3.76007342338562 seconds for part_3 Phones dataset KMeans method ICA dimencity reduction method

Part 3

3.7560791969299316 seconds for part_3 Phones dataset KMeans method RP dimencity reduction method

Part 3

3.8389766216278076 seconds for part_3 Phones dataset KMeans method LLE dimencity reduction method

Part 3

13.683567762374878 seconds for part_3 Phones dataset EM method PCA dimencity reduction method

Part 3

31.612959384918213 seconds for part_3 Phones dataset EM method ICA dimencity reduction method

Part 3

29.882699966430664 seconds for part_3 Phones dataset EM method RP dimencity reduction method

Part 3

27.456645011901855 seconds for part_3 Phones dataset EM method LLE dimencity reduction method

0.08100175857543945 seconds to train vanilla NN on Fruits dataset

Part 4 ----------

---

	precision	recall	f1-score	support
0.0	1.0000	0.6667	0.8000	15
1.0	0.7391	0.7391	0.7391	23
2.0	0.9524	0.9091	0.9302	44

3.0	0.7647	1.0000	0.8667	13
4.0	0.9167	1.0000	0.9565	33
5.0	0.9737	0.9737	0.9737	38
6.0	0.7143	0.7143	0.7143	14
accuracy			0.8889	180
macro avg	0.8658	0.8576	0.8544	180
weighted avg	0.8950	0.8889	0.8876	180

Part 4 ----------

0.07197928428649902 seconds to train PCA NN on Fruits dataset

---

	precision	recall	f1-score	support
0.0	1.0000	0.8667	0.9286	15
1.0	0.8182	0.7826	0.8000	23
2.0	0.9545	0.9545	0.9545	44
3.0	0.8125	1.0000	0.8966	13
4.0	0.9697	0.9697	0.9697	33
5.0	0.9744	1.0000	0.9870	38
6.0	0.7692	0.7143	0.7407	14
accuracy			0.9222	180
macro avg	0.8998	0.8983	0.8967	180
weighted avg	0.9232	0.9222	0.9214	180

Part 4 ----------

0.08754754066467285 seconds to train ICA NN on Fruits dataset

---

	precision	recall	f1-score	support
0.0	1.0000	0.8000	0.8889	15
1.0	0.6786	0.8261	0.7451	23
2.0	0.9535	0.9318	0.9425	44
3.0	0.8125	1.0000	0.8966	13
4.0	1.0000	1.0000	1.0000	33
5.0	1.0000	0.9737	0.9867	38
6.0	0.8182	0.6429	0.7200	14
accuracy			0.9111	180
macro avg	0.8947	0.8821	0.8828	180
weighted avg	0.9199	0.9111	0.9121	180

Part 4 ----------

0.07799196243286133 seconds to train RP NN on Fruits dataset

---

	precision	recall	f1-score	support
0.0	0.8571	0.8000	0.8276	15
1.0	0.8462	0.4783	0.6111	23
2.0	0.9149	0.9773	0.9451	44
3.0	0.7059	0.9231	0.8000	13
4.0	1.0000	0.9697	0.9846	33
5.0	1.0000	0.9737	0.9867	38
6.0	0.5500	0.7857	0.6471	14

accuracy			0.8778	180
macro avg	0.8392	0.8440	0.8289	180
weighted avg	0.8914	0.8778	0.8750	180

Part 4 ----------

0.0859827995300293 seconds to train LLE NN on Fruits dataset

---

	precision	recall	f1-score	support
0.0	0.7647	0.8667	0.8125	15
1.0	0.7083	0.7391	0.7234	23
2.0	0.9500	0.8636	0.9048	44
3.0	0.8333	0.7692	0.8000	13
4.0	0.9412	0.9697	0.9552	33
5.0	1.0000	1.0000	1.0000	38
6.0	0.8000	0.8571	0.8276	14
accuracy			0.8889	180
macro avg	0.8568	0.8665	0.8605	180
weighted avg	0.8925	0.8889	0.8897	180

Part 5 ----------

0.07302284240722656 seconds to train Vanila KMeans NN on Fruits dataset

---

	precision	recall	f1-score	support

0	1.0000	1.0000	1.0000	18
1	0.9730	1.0000	0.9863	36
2	1.0000	0.9375	0.9677	32
3	0.9000	0.9000	0.9000	20
4	1.0000	1.0000	1.0000	29
5	1.0000	1.0000	1.0000	23
6	0.9565	1.0000	0.9778	22
accuracy			0.9778	180
macro avg	0.9756	0.9768	0.9760	180
weighted avg	0.9782	0.9778	0.9777	180

Part 5 ----------

0.08691167831420898 seconds to train Vanila EM NN on Fruits dataset

---

	precision	recall	f1-score	support
0	0.9167	0.9565	0.9362	23
1	0.9730	0.9730	0.9730	37
2	1.0000	0.9706	0.9851	34
3	0.9167	0.9167	0.9167	12
4	0.9286	0.9512	0.9398	41
5	0.9643	1.0000	0.9818	27
6	0.5000	0.3333	0.4000	6
accuracy			0.9444	180
macro avg	0.8856	0.8716	0.8761	180
weighted avg	0.9399	0.9444	0.9415	180

Part 5 ----------

0.04200148582458496 seconds to train PCA KMeans NN on Fruits dataset

---

	precision	recall	f1-score	support
0	1.0000	0.9444	0.9714	18
1	0.9730	1.0000	0.9863	36
2	1.0000	0.9375	0.9677	32
3	0.8889	0.8000	0.8421	20
4	0.9677	1.0000	0.9836	30
5	0.9583	1.0000	0.9787	23
6	0.9130	1.0000	0.9545	21
accuracy			0.9611	180
macro avg	0.9573	0.9546	0.9549	180
weighted avg	0.9614	0.9611	0.9604	180

Part 5 ----------

0.049919843673706055 seconds to train PCA EM NN on Fruits dataset

---

	precision	recall	f1-score	support
0	0.9697	0.9697	0.9697	33
1	0.9737	1.0000	0.9867	37
2	0.5000	0.4000	0.4444	5
3	0.9130	0.9130	0.9130	23

4	0.8824	0.8824	0.8824	17
5	0.9630	1.0000	0.9811	26
6	0.9474	0.9231	0.9351	39
accuracy			0.9389	180
macro avg	0.8784	0.8697	0.8732	180
weighted avg	0.9362	0.9389	0.9373	180

Part 5 ----------

0.07103371620178223 seconds to train ICA KMeans NN on Fruits dataset

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	precision	recall	f1-score	support
0	0.9773	0.9149	0.9451	47
1	0.9091	0.9677	0.9375	31
2	1.0000	1.0000	1.0000	27
3	0.9130	0.9545	0.9333	22
4	0.9737	0.9737	0.9737	38
5	0.8667	0.8667	0.8667	15
accuracy			0.9500	180
macro avg	0.9400	0.9463	0.9427	180
weighted avg	0.9511	0.9500	0.9501	180

Part 5 ----------

0.08524680137634277 seconds to train ICA EM NN on Fruits dataset

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	precision	recall	f1-score	support
0	0.8409	0.9487	0.8916	39
1	0.8929	0.7812	0.8333	32
2	0.7500	0.7500	0.7500	4
3	0.7500	0.5000	0.6000	6
4	0.9643	1.0000	0.9818	27
5	0.9744	0.9500	0.9620	40
6	0.9394	0.9688	0.9538	32
accuracy			0.9111	180
macro avg	0.8731	0.8427	0.8532	180
weighted avg	0.9108	0.9111	0.9086	180

Part 5 ----------

0.06600213050842285 seconds to train RP KMeans NN on Fruits dataset

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	precision	recall	f1-score	support
0	0.9565	0.9167	0.9362	24
1	0.9524	0.9091	0.9302	22
2	1.0000	0.7391	0.8500	23
3	0.9412	1.0000	0.9697	32
4	0.9062	0.9667	0.9355	30
5	1.0000	1.0000	1.0000	20
6	0.8788	1.0000	0.9355	29
accuracy			0.9389	180

macro avg	0.9479	0.9331	0.9367	180
weighted avg	0.9428	0.9389	0.9373	180

Part 5 ----------

0.14996623992919922 seconds to train RP EM NN on Fruits dataset

---

	precision	recall	f1-score	support
0	0.9000	0.9643	0.9310	28
1	0.9062	0.9667	0.9355	30
2	0.8947	0.8718	0.8831	39
3	0.9714	0.9444	0.9577	36
4	0.9677	0.9677	0.9677	31
5	0.7500	0.7500	0.7500	8
6	0.6667	0.5000	0.5714	8
accuracy			0.9111	180
macro avg	0.8653	0.8521	0.8567	180
weighted avg	0.9088	0.9111	0.9090	180

Part 5 ----------

0.07200860977172852 seconds to train LLE KMeans NN on Fruits dataset

---

	precision	recall	f1-score	support
0	1.0000	0.9545	0.9767	22
1	0.9747	1.0000	0.9872	77

2	1.0000	1.0000	1.0000	9
3	1.0000	0.9655	0.9825	29
4	1.0000	1.0000	1.0000	36
5	1.0000	1.0000	1.0000	3
6	1.0000	1.0000	1.0000	4
accuracy			0.9889	180
macro avg	0.9964	0.9886	0.9923	180
weighted avg	0.9892	0.9889	0.9888	180

Part 5 ----------

0.07400321960449219 seconds to train LLE EM NN on Fruits dataset

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	precision	recall	f1-score	support
0	0.8824	1.0000	0.9375	15
1	1.0000	1.0000	1.0000	28
2	1.0000	1.0000	1.0000	35
3	1.0000	1.0000	1.0000	36
4	0.8889	0.9412	0.9143	17
5	1.0000	0.9375	0.9677	16
6	1.0000	0.9394	0.9688	33
accuracy			0.9778	180
macro avg	0.9673	0.9740	0.9698	180
weighted avg	0.9797	0.9778	0.9781	180

276.24444246292114, ' seconds to run whole assignment on 8 logical cores CPU'