

Question #1

- i. The dataset contains 80 instances.
- ii. The dataset contains 7 input attributes.
- iii. The output attribute has 2 possible values.
- iv. Two input attributes are 4.
- v. The class ratio of Male-Female is (46-34)

Q2:

1) Standard Train/Test Split

92% accuracy: So 3 instances were incorrectly classified using the Random Forest algorithm.

74% accuracy: So 7 instances were incorrectly classified using the Support Vector Machine algorithm.

55% accuracy: So 11 instances were incorrectly classified using the Multilayer Perceptron Classifier.

2) 80/20 Train Test Split

100 % accuracy: So 0 instances were incorrectly classified using the Random Forest algorithm.

81 % accuracy: So 5 instances were incorrectly classified using the Support Vector Machine algorithm.

93% accuracy: So 2 instances were incorrectly classified using the Multilayer Perceptron Classifier.

- In 80/20 split the accuracy of the model increases, which can be seen that less number of instances were classified incorrectly.

3) Scarf and Beard are the most powerful attributes in the Prediction task because they have distinct values for males and females in almost most of the instances.

4) By removing the above two attributes the accuracy of the system is reduced. Like by applying specified classifier algorithms the accuracy compared to previous decreases.

Q 3: Monte Carlo cross-validation:

F1 Score: 0.94 Parameters: ShuffleSplit(train_size=0.66, test_size=0.34, n_splits = 5)

Leave P-Out cross-validation:

F1 Score: 0.96 Parameters: p=5

Q 4: 5 instances for testing are:

I create another .csv file named as gender-prediction-test, and add the below 5 instances

for testing in that file. After applying the accuracy was 80%

1. height: 63, Beard: no, weight: 150, hair length: medium, shoe size: 41, scarf: yes, eye color: blue, gender: female

2. height: 81, Beard: no, weight: 182, hair length: Short, shoe size: 38, scarf: NO, eye color: brown, gender: female
3. height: 76, Beard: Yes, weight: 170, hair length: Long, shoe size: 37, scarf: NO, eye color: brown, gender: Male
4. height: 85, Beard: Yes, weight: 200, hair length: Bald, shoe size: 44, scarf: NO, eye color: Grey, gender: Male
5. . height: 79, Beard: NO, weight: 119, hair length: Short, shoe size: 40, scarf: NO, eye color: black, gender: Male

	precision	recall	f1-score	support
0	1.00	0.50	0.67	2
1	0.75	1.00	0.86	3
accuracy	0.80			5
macro avg	0.88	0.75	0.76	5
weighted avg	0.85	0.80	0.78	