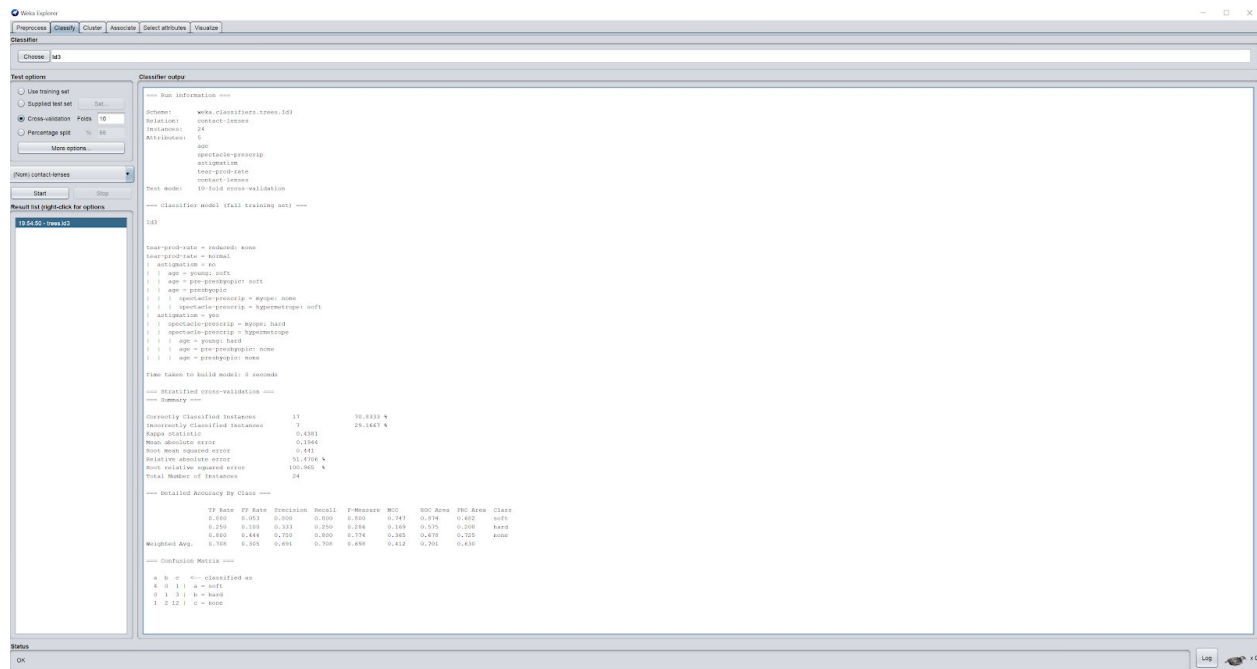


Part B

Q1:



=== Run information ===

Scheme: weka.classifiers.trees.Id3

Relation: contact-lenses

Instances: 24

Attributes: 5

age

spectacle-prescrip

astigmatism

tear-prod-rate

contact-lenses

Test mode: 10-fold cross-validation

=== Classifier model (full training set) ===

Id3

tear-prod-rate = reduced: none

tear-prod-rate = normal

| astigmatism = no

| | age = young: soft

| | age = pre-presbyopic: soft

```
| | age = presbyopic
| | | spectacle-prescrip = myope: none
| | | spectacle-prescrip = hypermetrope: soft
| astigmatism = yes
| | spectacle-prescrip = myope: hard
| | spectacle-prescrip = hypermetrope
| | | age = young: hard
| | | age = pre-presbyopic: none
| | | age = presbyopic: none
```

Time taken to build model: 0 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances	17	70.8333 %
Incorrectly Classified Instances	7	29.1667 %
Kappa statistic	0.4381	
Mean absolute error	0.1944	
Root mean squared error	0.441	
Relative absolute error	51.4706 %	
Root relative squared error	100.965 %	
Total Number of Instances	24	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	
Class									
	0.800	0.053	0.800	0.800	0.800	0.747	0.874	0.682	soft
	0.250	0.100	0.333	0.250	0.286	0.169	0.575	0.208	hard
	0.800	0.444	0.750	0.800	0.774	0.365	0.678	0.725	none
Weighted Avg.	0.708	0.305	0.691	0.708	0.698	0.412	0.701	0.630	

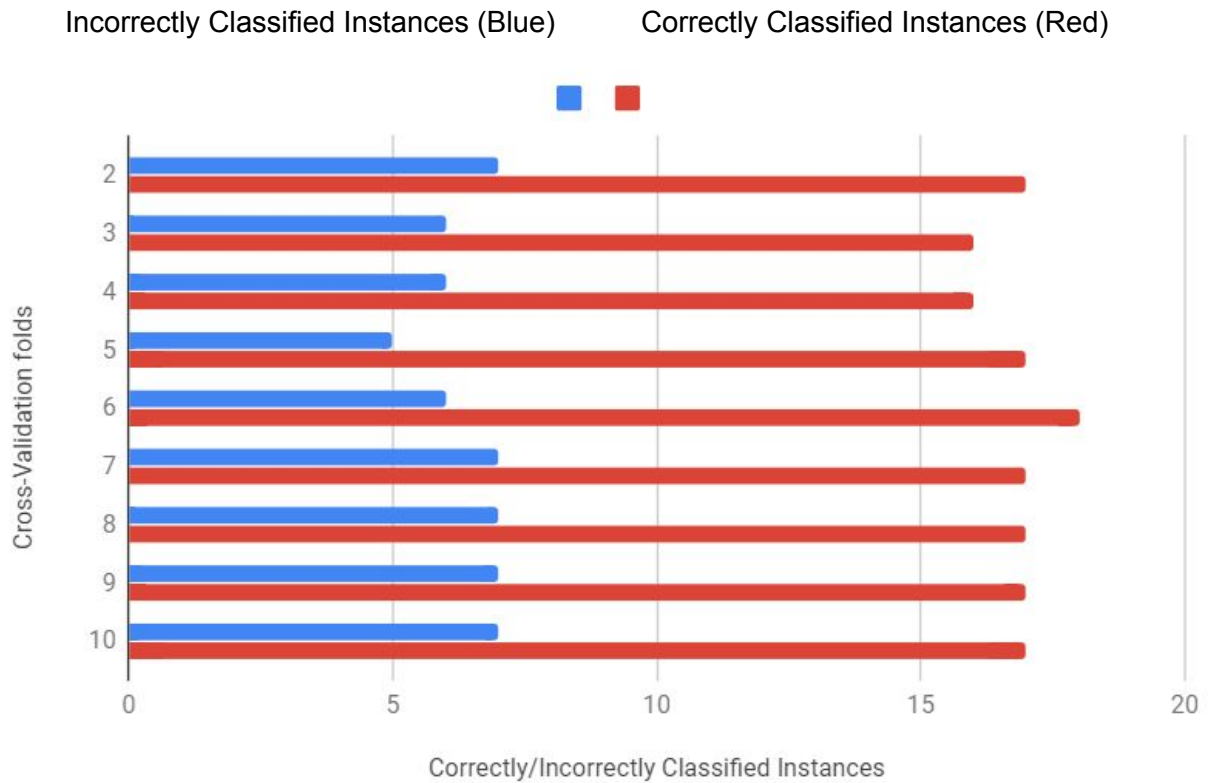
=== Confusion Matrix ===

```
a b c <-- classified as
4 0 1 | a = soft
0 1 3 | b = hard
1 2 12 | c = none
```

Q2:

Cross-Validation allows us to compare different machine learning methods and get a sense of how well they will work in practice. We divide the information into 10 “blocks” and we sample that data to find the best variant.

Q3:



Using training set, all the instances (24) were classified correctly. Using training sets is better for testing because it performs the best.