KNN

Record % correctly classified and confusion matrix (ALL positive class). Derive the confusion matrix when AML is the positive class. Calculate the class-dependent TP and FP rates. Show your work and compare to Weka.

	Predicted class	
True Class	Yes	No
Yes	TP: True Positive	FN: False Negative
No	FP: False Positive	TN: True Negative

$$TP\ rate\ = \frac{TP}{TP + FN}$$

$$FP\ rate\ = \frac{FP}{FP + TN}$$

```
Correctly Classified Instances          68               94.4444 %

TP Rate  FP Rate  Class
1.000    0.143    ALL
0.857    0.000    AML


=== Confusion Matrix ===

ALL as the positive class (Weka):

      a  b   <-- classified as
     44  0 |  a = ALL
      4 24 |  b = AML
```

$$TP\ rate\ = \frac{44}{44 + 0} = 1.000$$

$$FP\ rate\ = \frac{4}{4 + 24} = 0.143$$

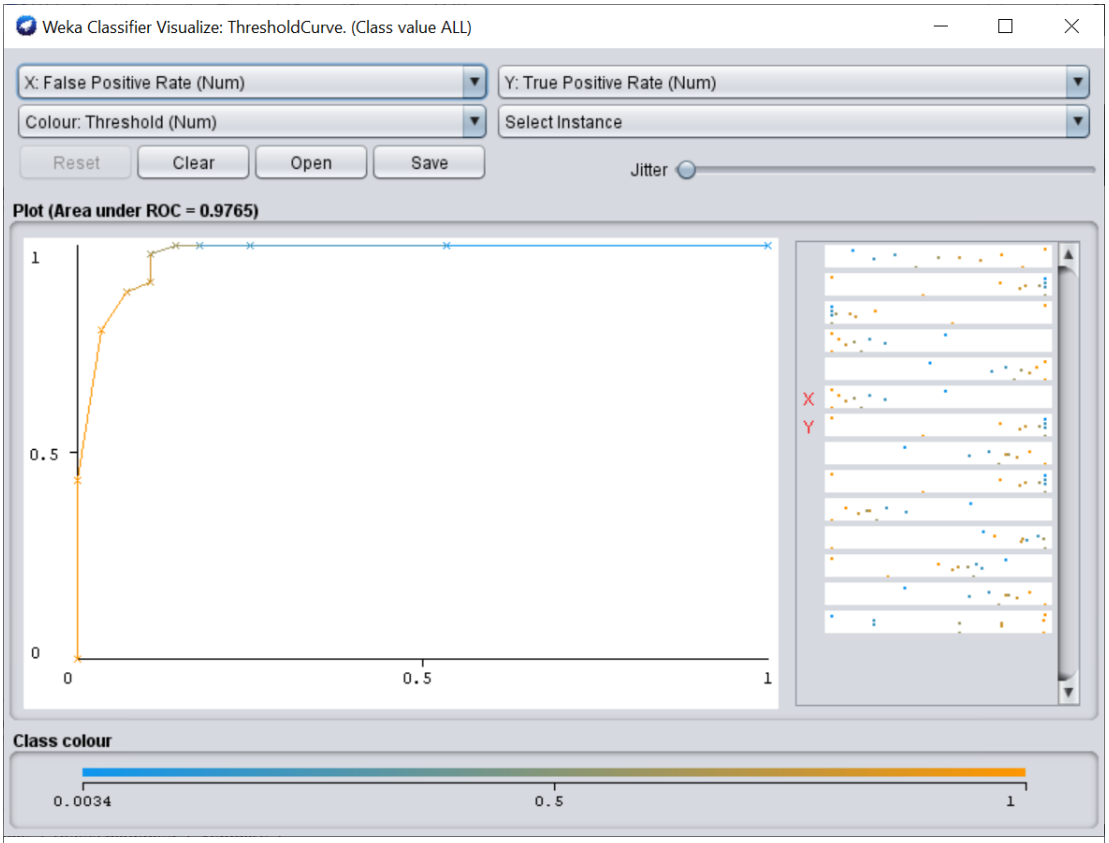
```
AML as the positive class (Derived):

      b  a   <-- classified as
     24  4 |  b = AML
      0 44 |  a = ALL
```

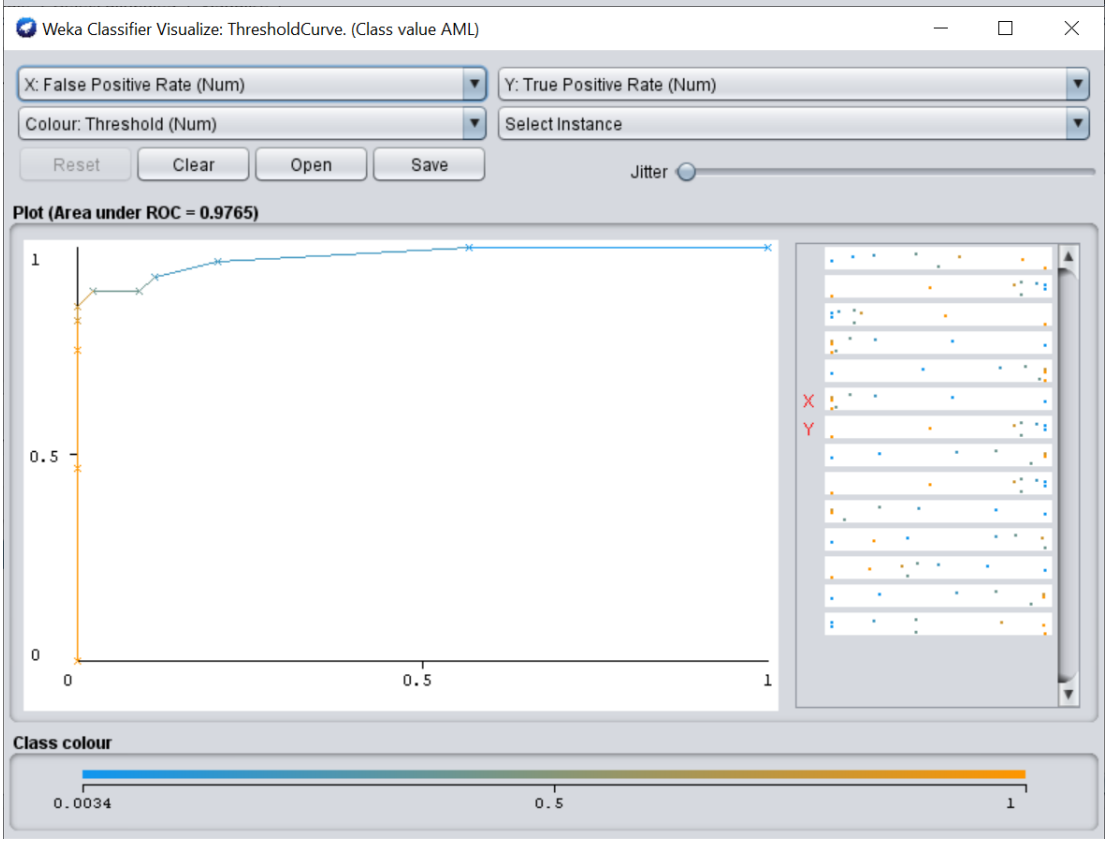
$$TP\ rate\ = \frac{24}{24 + 4} = 0.857$$

$$FP\ rate\ = \frac{0}{0 + 44} = 0.000$$

My calculated values match the Weka results.

KNN: Capture the ROC curves for ALL positive and AML positive.





ZeroR

Record % correctly classified and confusion matrix (ALL positive class). Derive the confusion matrix when AML is the positive class. Calculate the class-dependent TP and FP rates. Show your work and compare to Weka.

	Predicted class	
True Class	Yes	No
Yes	TP: True Positive	FN: False Negative
No	FP: False Positive	TN: True Negative

$$TP\ rate\ = \frac{TP}{TP + FN}$$

$$FP\ rate\ = \frac{FP}{FP + TN}$$

```
Correctly Classified Instances          44               61.1111 %

TP Rate  FP Rate  Class
1.000    1.000    ALL
0.000    0.000    AML


=== Confusion Matrix ===

ALL as the positive class (Weka):

       a  b   <-- classified as
      44  0 |  a = ALL
      28  0 |  b = AML
```

$$TP\ rate\ = \frac{44}{44 + 0} = 1.000$$

$$FP\ rate\ = \frac{28}{28 + 0} = 1.000$$

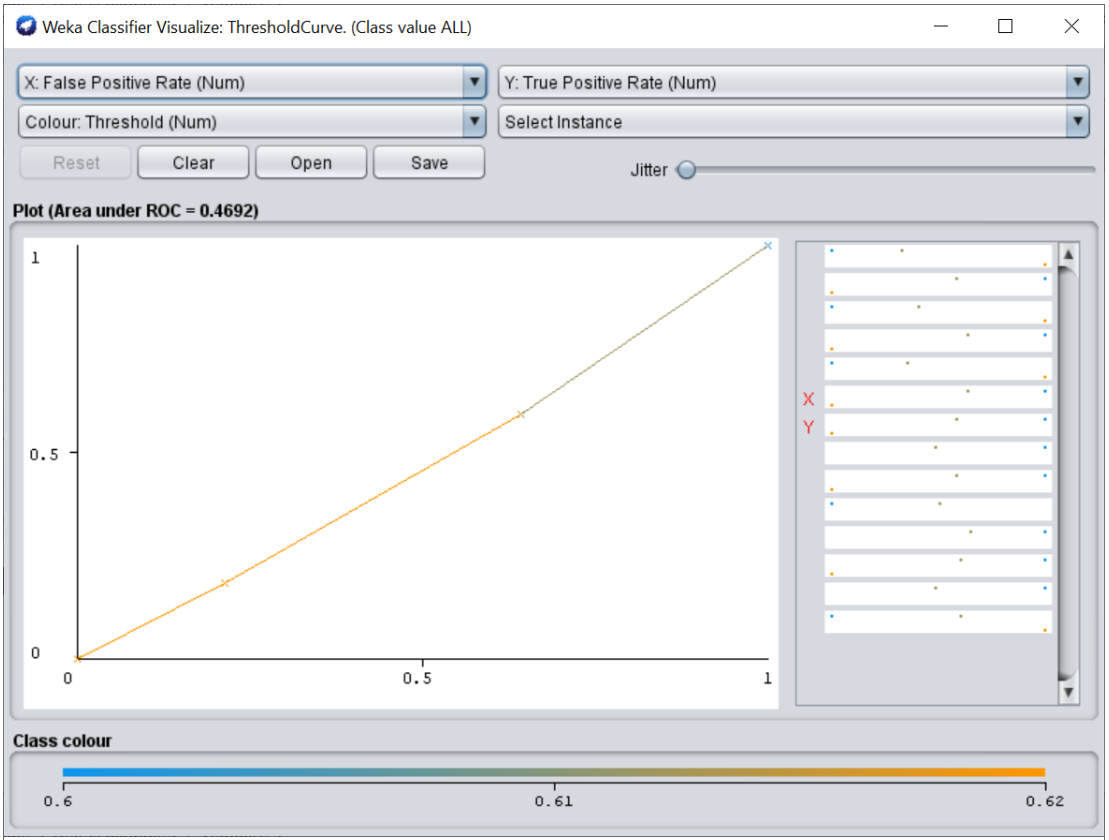
```
AML as the positive class (Derived):

      b   a   <-- classified as
      0  28 |  b = AML
      0  44 |  a = ALL
```

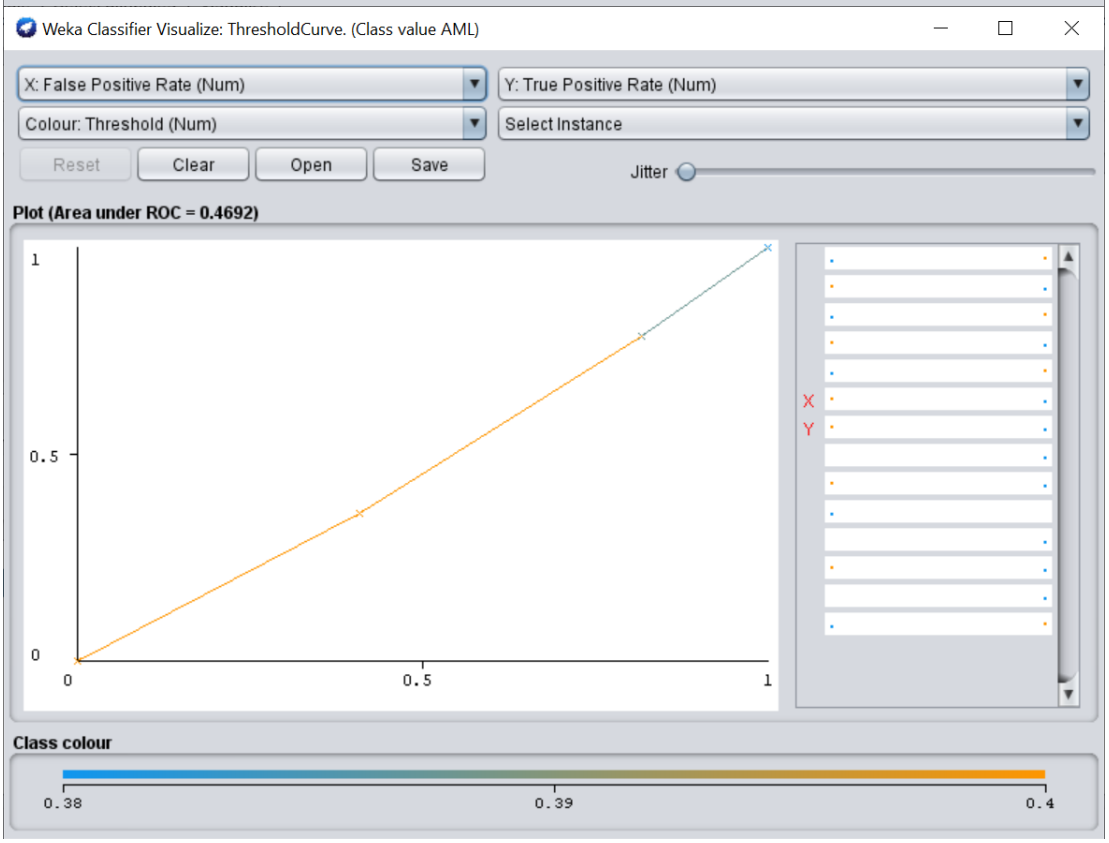
$$TP\ rate\ = \frac{0}{0 + 28} = 0.000$$

$$FP\ rate\ = \frac{0}{0 + 44} = 0.000$$

My calculated values match the Weka results.

ZeroR: Capture the ROC curves for ALL positive and AML positive.





KNN

```
=== Run information ===

Scheme:       weka.classifiers.lazy.IBk -K 5 -W 0 -A "weka.core.neighboursearch.LinearNNSearch -A
\"weka.core.EuclideanDistance -R first-last\""
Relation:     leukemia gene expression data names changed
Instances:    72
Attributes:   151
              [list of attributes omitted]
Test mode:    5-fold cross-validation

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

IB1 instance-based classifier
using 5 nearest neighbour(s) for classification


Time taken to build model: 0 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances          68               94.4444 %
Incorrectly Classified Instances         4                5.5556 %
Kappa statistic                          0.88
Mean absolute error                      0.0917
Root mean squared error                  0.2235
Relative absolute error                 19.2509 %
Root relative squared error             45.7979 %
Total Number of Instances               72

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 1.000    0.143    0.917      1.000    0.957      0.886    0.976     0.978     ALL
                 0.857    0.000    1.000      0.857    0.923      0.886    0.976     0.967     AML
Weighted Avg.    0.944    0.087    0.949      0.944    0.944      0.886    0.976     0.973

=== Confusion Matrix ===

  a  b   <-- classified as
 44  0 |  a = ALL
  4 24 |  b = AML
```

ZeroR

```
=== Run information ===

Scheme:       weka.classifiers.rules.ZeroR
Relation:     leukemia gene expression data names changed
Instances:    72
Attributes:   151
              [list of attributes omitted]
Test mode:    5-fold cross-validation

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

ZeroR predicts class value: ALL

Time taken to build model: 0 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances          44               61.1111 %
Incorrectly Classified Instances        28               38.8889 %
Kappa statistic                          0
Mean absolute error                      0.4765
Root mean squared error                  0.4879
Relative absolute error                100      %
Root relative squared error            100      %
Total Number of Instances               72

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 1.000    1.000    0.611      1.000    0.759      ?        0.469     0.596     ALL
                 0.000    0.000    ?          0.000    ?          ?        0.469     0.373     AML
Weighted Avg.    0.611    0.611    ?          0.611    ?          ?        0.469     0.509

=== Confusion Matrix ===

  a  b   <-- classified as
 44  0 |  a = ALL
 28  0 |  b = AML
```