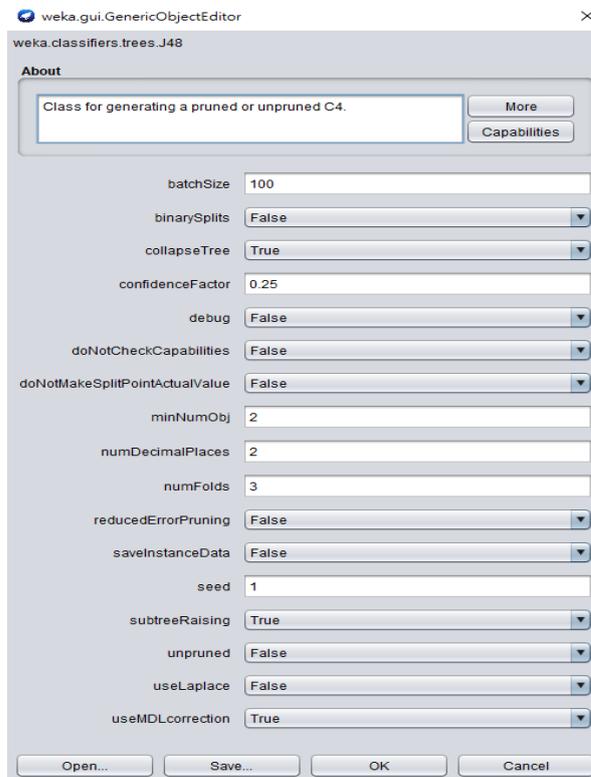


Hyperparameters of Algorithms for the whole dataset are listed as follows.

1. Decision tree

Set as default



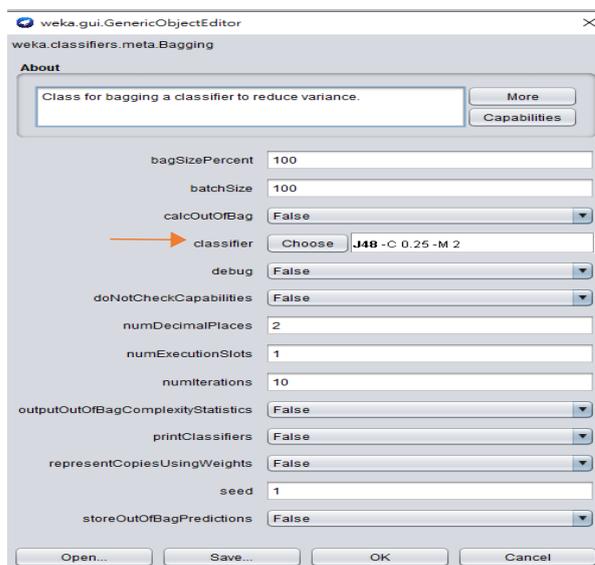
The screenshot shows the 'weka.gui.GenericObjectEditor' window for the 'weka.classifiers.trees.J48' classifier. The 'About' section contains a text box with the description 'Class for generating a pruned or unpruned C4.' and buttons for 'More' and 'Capabilities'. The main configuration area includes the following parameters:

Parameter	Value
batchSize	100
binarySplits	False
collapseTree	True
confidenceFactor	0.25
debug	False
doNotCheckCapabilities	False
doNotMakeSplitPointActualValue	False
minNumObj	2
numDecimalPlaces	2
numFolds	3
reducedErrorPruning	False
saveInstanceData	False
seed	1
subtreeRaising	True
unpruned	False
useLaplace	False
useMDLcorrection	True

Buttons at the bottom: Open..., Save..., OK, Cancel.

2. Bagging with decision tree

Classifier Choose J48 (orange arrow)



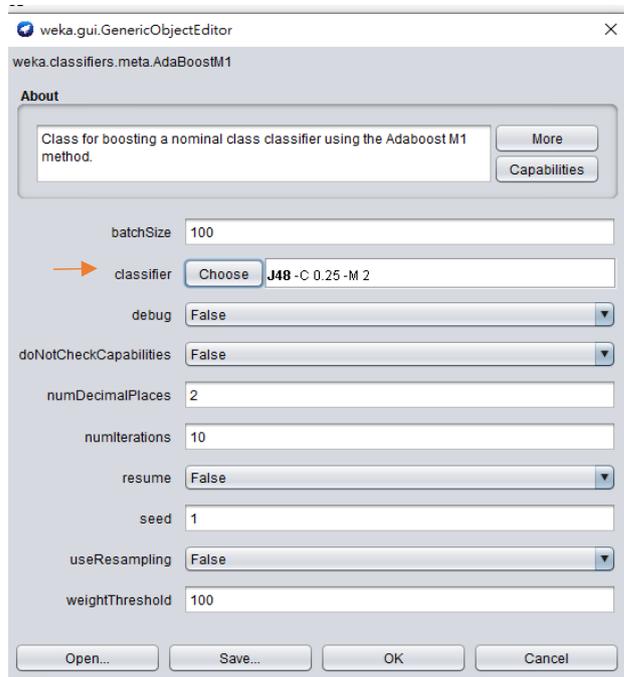
The screenshot shows the 'weka.gui.GenericObjectEditor' window for the 'weka.classifiers.meta.Bagging' classifier. The 'About' section contains a text box with the description 'Class for bagging a classifier to reduce variance.' and buttons for 'More' and 'Capabilities'. The main configuration area includes the following parameters:

Parameter	Value
bagSizePercent	100
batchSize	100
calcOutOfBag	False
classifier	Choose J48 - C 0.25 - M 2
debug	False
doNotCheckCapabilities	False
numDecimalPlaces	2
numExecutionSlots	1
numIterations	10
outputOutOfBagComplexityStatistics	False
printClassifiers	False
representCopiesUsingWeights	False
seed	1
storeOutOfBagPredictions	False

An orange arrow points to the 'classifier' field. Buttons at the bottom: Open..., Save..., OK, Cancel.

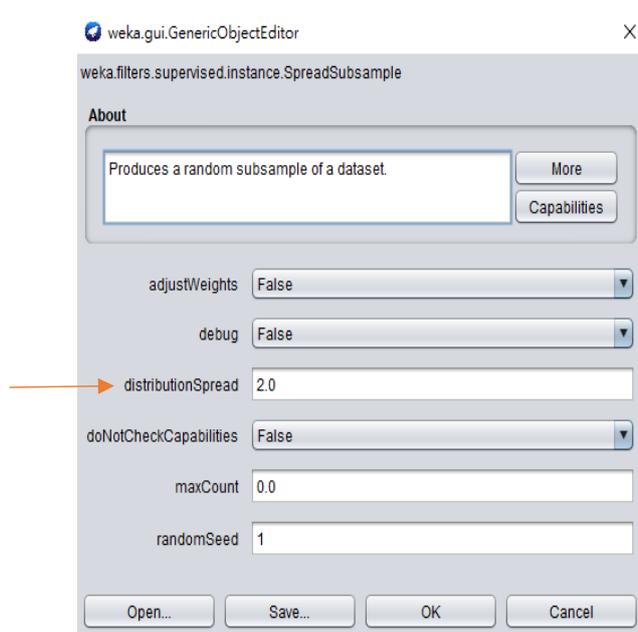
3. AdaBoost with decision tree

Classifier Choose J48 (orange arrow)



4. SpreadSubsample with Decision tree

The value of distributionSpread was adjusted as 2.0



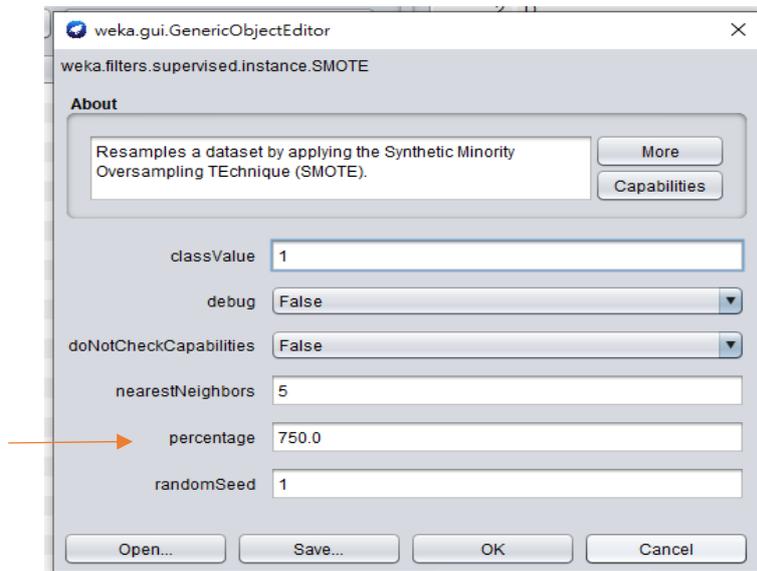
5. SMOTE with Decision tree

Class A has the highest frequency and its frequency is not adjusted. The frequencies of other classes were adjusted to nearly the same with that of Class A, by adjusting the percentage (orange arrow). The following figures are listed by the order of classValue. The classValue of Class A is 4,

For Class C

classValue: 1

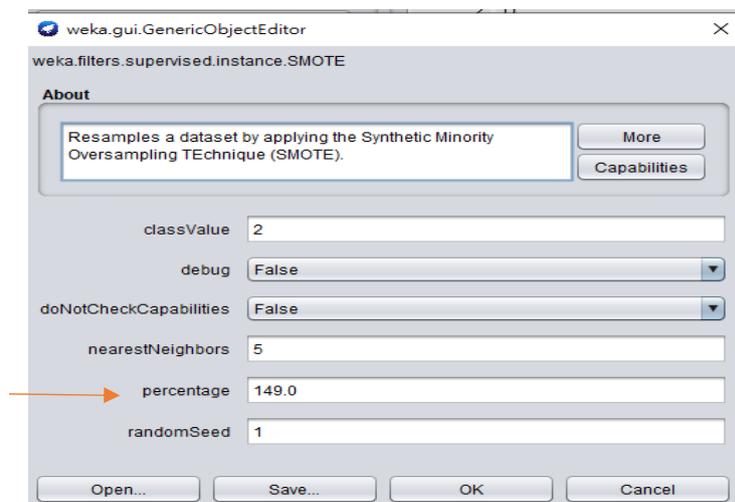
percentage: 750



For Class D

classValue: 2

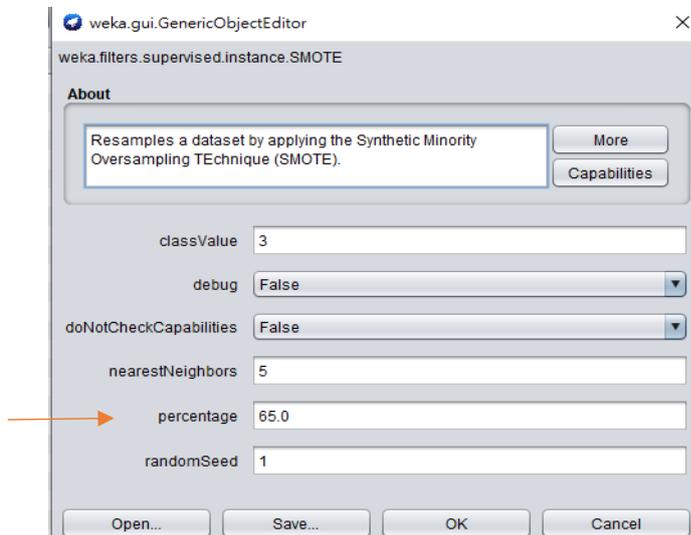
percentage: 149



For Class B

classValue: 3

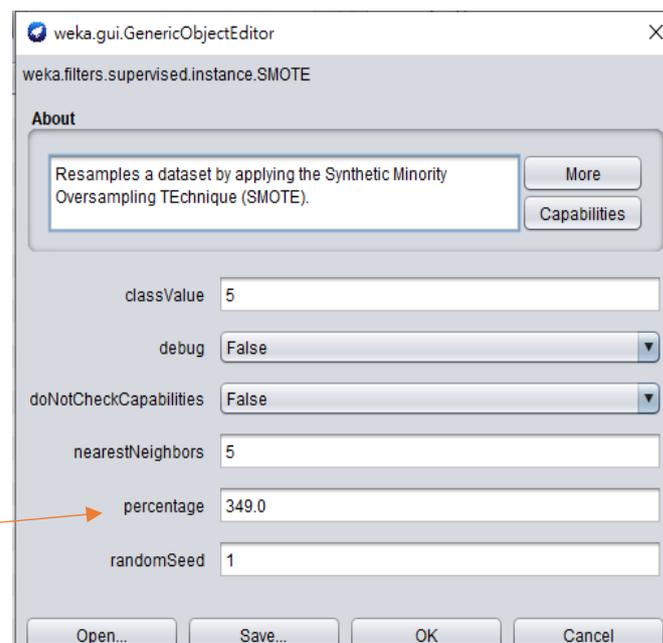
percentage: 65



Class E

classValue: 5

percentage: 349



6. Multilayer perceptron

Set as default

The image shows a screenshot of the Weka GUI for the MultilayerPerceptron classifier. The window title is "weka.gui.GenericObjectEditor" and the content area is titled "weka.classifiers.functions.MultilayerPerceptron".

About

A classifier that uses backpropagation to learn a multi-layer perceptron to classify instances.

More
Capabilities

GUI False

autoBuild True

batchSize 100

debug False

decay False

doNotCheckCapabilities False

hiddenLayers a

learningRate 0.3

momentum 0.2

nominalToBinaryFilter True

normalizeAttributes True

normalizeNumericClass True

numDecimalPlaces 2

reset True

resume False

seed 0

trainingTime 500

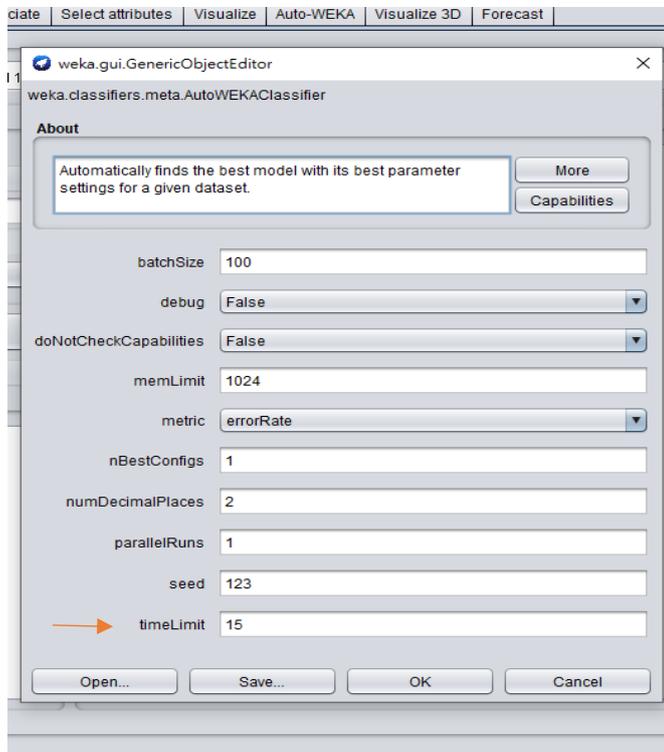
validationSetSize 0

validationThreshold 20

Open... **Save...** **OK** **Cancel**

7. AutoWEKA

Set as default. For better performance, try giving Auto-WEKA more time.
(orange arrow)



Hyperparameters of Algorithm for General Surgery dataset

Only the hyperparameters of SMOTE with decision tree are listed here. The hyperparameters of other algorithms are set as default.

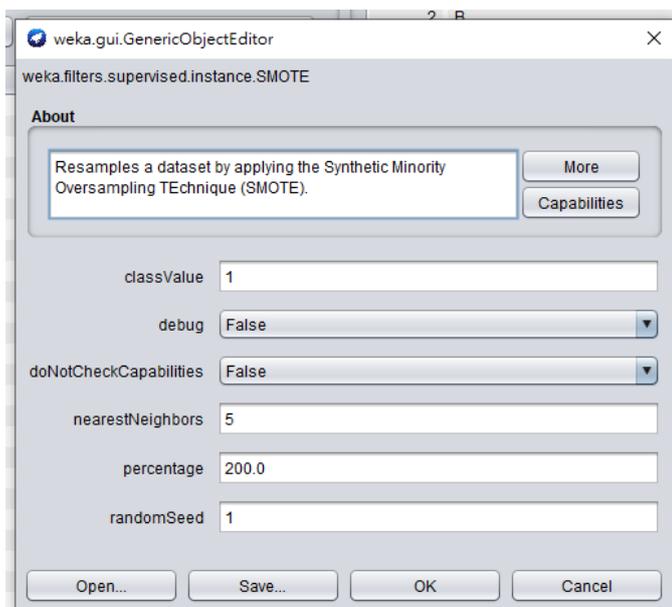
SMOTE with Decision tree:

Class A has the highest frequency and its frequency is not adjusted. The frequencies of other classes were adjusted to nearly the same with that of Class A, by adjusting the percentage (orange arrow). The following figures are listed by the order of classValue. The classValue of Class A is 3,

For class D:

class Value: 1

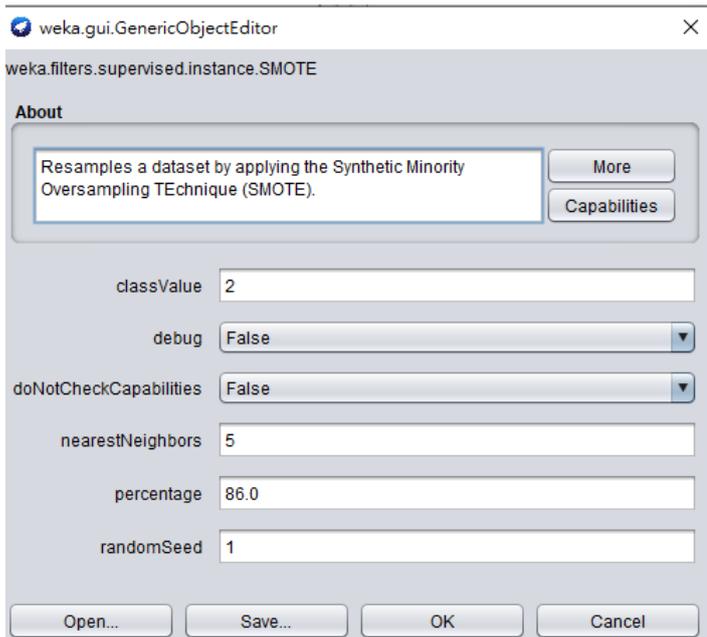
Percentage: 200



For Class B

classValue: 2

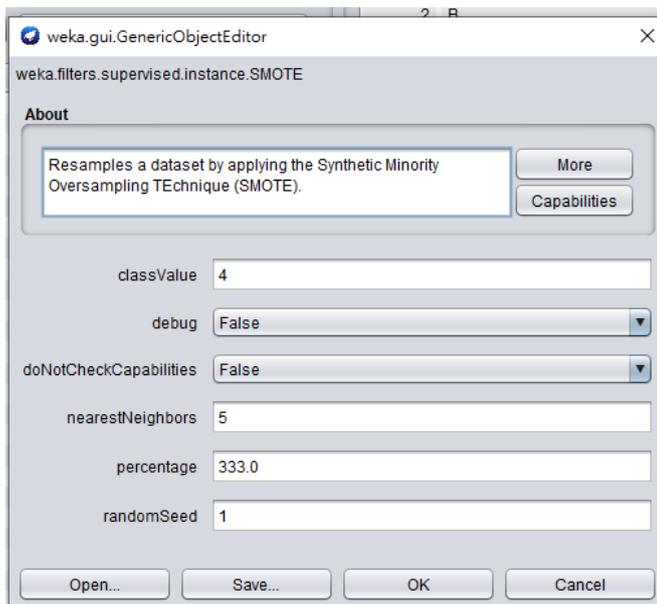
percentage: 86



For Class E

classValue: 4

percentage: 333

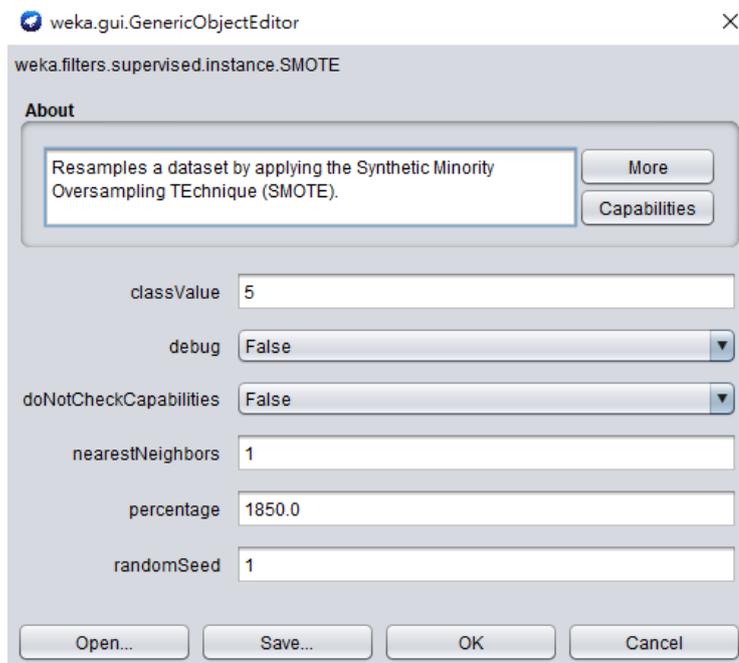


For Class C

classValue: 5

nearestNeighbors: 1

percentage: 1850



The hyperparameters of SimpleLogistic are as default setting.

Hyperparameters of Algorithm for General Urology dataset

Only the hyperparameters of SMOTE with decision tree are listed here. The hyperparameters of other algorithms are set as default.

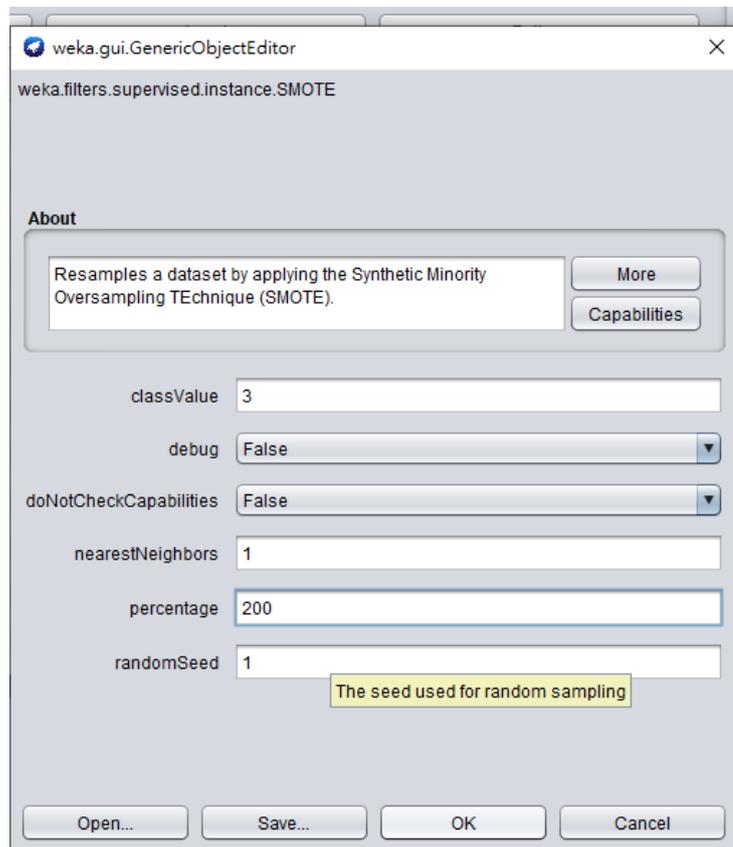
SMOTE with Decision tree:

Class A has the highest frequency and its frequency is not adjusted. The frequencies of other classes were adjusted to nearly the same with that of Class A, by adjusting the percentage (orange arrow). The following figures are listed by the order of classValue. The classValue of Class A is 1,

Class D

classValue: 3

percentage: 200



Class C:
 calssValue: 4
 percentage: 200

The screenshot shows the Weka Explorer interface with the SMOTE configuration window open. The configuration includes:

- classValue: 4
- percentage: 200.0
- randomSeed: 1

The 'Selected attribute' table displays the following data:

Name	Class	Missing	Distinct	Type	Nominal Unique	Weight
No.	Label		Count			
1	A		24		24.0	
2	B		23		23.0	
3	D		24		24.0	
4	C		24		24.0	

The bar chart below the table shows four bars representing the counts for classes A (blue, 24), B (red, 23), D (cyan, 24), and C (grey, 24).

The final frequencies of the classes were adjusted as the following figure.

The screenshot shows the Weka Explorer interface with the SMOTE configuration window open. The configuration includes:

- classValue: 5
- percentage: 1850.0
- randomSeed: 1

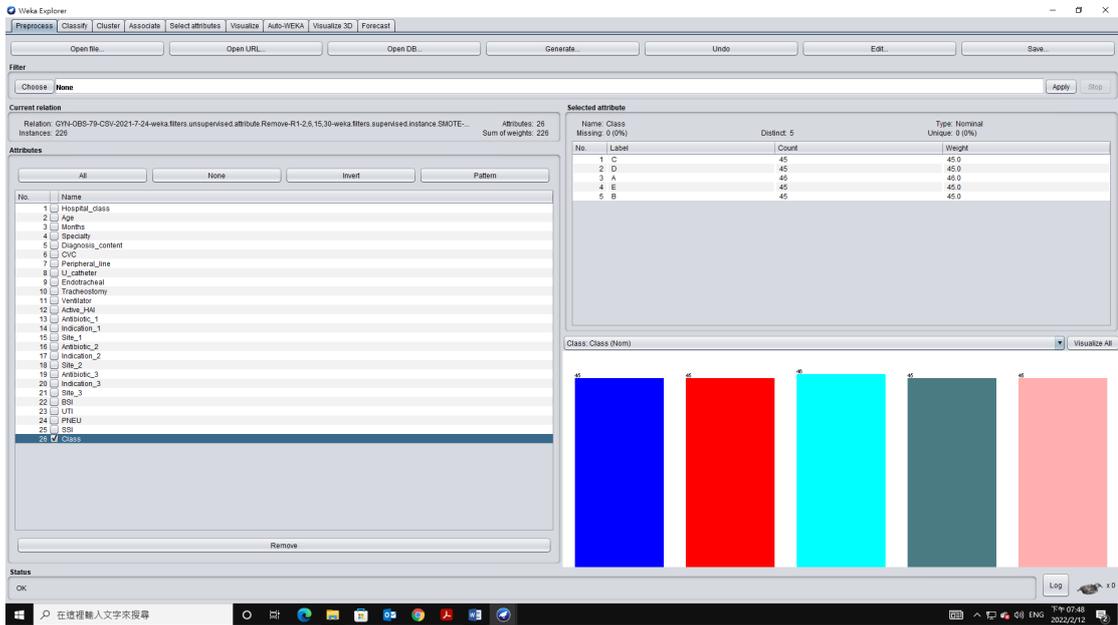
The 'Selected attribute' table displays the following data:

Name	Class	Missing	Distinct	Type	Nominal Unique	Weight
No.	Label		Count			
1	A		24		24.0	
2	B		23		23.0	
3	D		24		24.0	
4	C		24		24.0	

The bar chart below the table shows four bars representing the counts for classes A (blue, 24), B (red, 23), D (cyan, 24), and C (grey, 24).

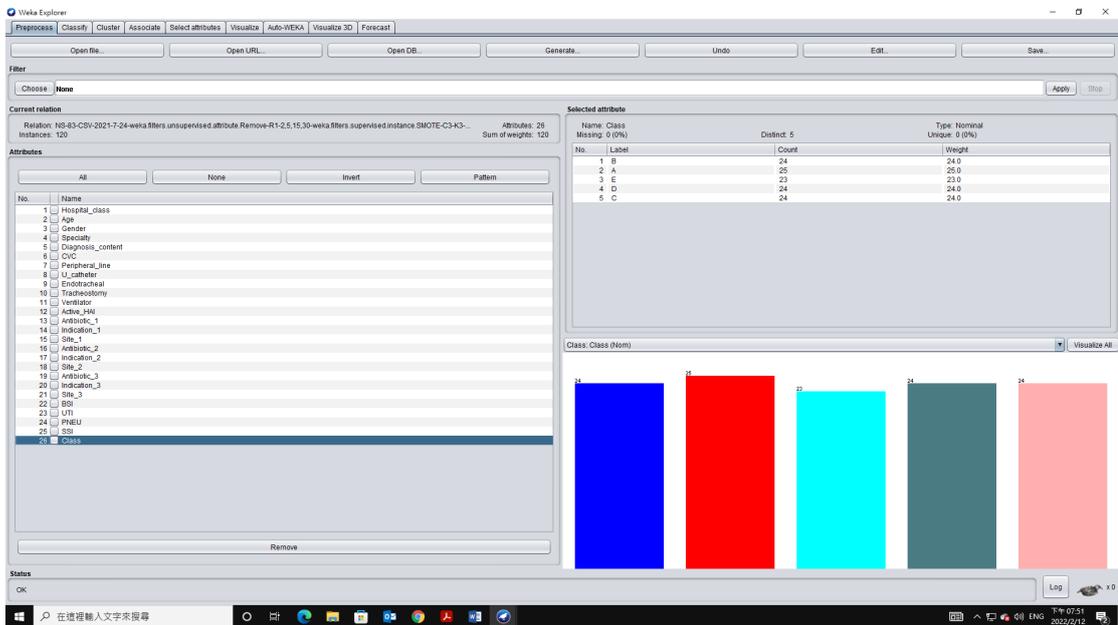
SMOTE for Obstetrics and Gynecology:

The final frequencies of the classes were adjusted as the following figure.



SMOTE for Neurosurgery:

The final frequencies of the classes were adjusted as the following figure.



SMOTE for Orthopedics:

The final frequencies of the classes were adjusted as the following figure.

