Computer Aided Detection and Diagnosis of Breast Cancer

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## Data for analyze

library(data.table)  
library(dplyr)  
  
filePath <- "results-p03-full.csv"  
  
all\_dt <- fread(filePath, stringsAsFactors = TRUE, dec=".")  
  
tibble(all\_dt)

## # A tibble: 1,311 x 15  
## PatientId LeftOrRightBrest ImageView FullFilePath ROIFilePath TestOrTraining  
## <fct> <fct> <fct> <fct> <fct> <fct>   
## 1 P\_00038 LEFT CC ./data/CALC~ ./data/CAL~ test   
## 2 P\_00038 LEFT MLO ./data/CALC~ ./data/CAL~ test   
## 3 P\_00100 RIGHT CC ./data/CALC~ ./data/CAL~ test   
## 4 P\_00100 RIGHT MLO ./data/CALC~ ./data/CAL~ test   
## 5 P\_00132 LEFT MLO ./data/CALC~ ./data/CAL~ test   
## 6 P\_00127 RIGHT CC ./data/CALC~ ./data/CAL~ test   
## 7 P\_00127 RIGHT MLO ./data/CALC~ ./data/CAL~ test   
## 8 P\_00141 LEFT CC ./data/CALC~ ./data/CAL~ test   
## 9 P\_00150 RIGHT MLO ./data/CALC~ ./data/CAL~ test   
## 10 P\_00163 LEFT CC ./data/CALC~ ./data/CAL~ test   
## # ... with 1,301 more rows, and 9 more variables: BrestDensity <int>,  
## # CalcType <fct>, CalcDistribution <fct>, Patology <fct>, LesionVolume <dbl>,  
## # LesionArea <dbl>, SphericalDisproportion <dbl>, Sphericity <dbl>,  
## # SurfaceToVolumeRatio <dbl>

This dataset consists of 1311 instances with 15 features:

all\_dt$PatientId <- NULL  
all\_dt$FullFilePath <- NULL  
all\_dt$ROIFilePath <- NULL  
  
all\_dt$LeftOrRightBrest <- as.numeric(all\_dt$LeftOrRightBrest)  
all\_dt$LeftOrRightBrest <- NULL  
  
all\_dt$ImageView <- as.numeric(all\_dt$ImageView)  
all\_dt$ImageView <- NULL  
  
all\_dt$TestOrTraining <- as.numeric(all\_dt$TestOrTraining)  
all\_dt$TestOrTraining <- NULL  
  
all\_dt$CalcType <- as.numeric(all\_dt$CalcType)  
all\_dt$CalcDistribution <- as.numeric(all\_dt$CalcDistribution)  
all\_dt$Patology <- as.numeric(all\_dt$Patology)  
  
head(all\_dt)

## BrestDensity CalcType CalcDistribution Patology LesionVolume LesionArea  
## 1: 2 19 1 1 95.4425 2.34285  
## 2: 2 19 1 1 92.8025 2.29005  
## 3: 4 11 1 1 97.5525 2.42505  
## 4: 4 11 1 1 86.7525 2.16905  
## 5: 4 1 10 1 608.0525 13.38705  
## 6: 2 11 1 2 121.7725 2.96545  
## SphericalDisproportion Sphericity SurfaceToVolumeRatio  
## 1: 0.002040456 490.0866 0.02454724  
## 2: 0.002015944 496.0455 0.02467660  
## 3: 0.002050132 487.7734 0.02485892  
## 4: 0.001900044 526.3037 0.02500274  
## 5: 0.003201888 312.3157 0.02201627  
## 6: 0.001938515 515.8589 0.02435238

### Preprocessing

Firstly, data should be set in adequate format.

all\_dt\_ex <- fread(filePath, stringsAsFactors = TRUE, dec=".")  
all\_dt\_ex$PatientId <- NULL  
all\_dt\_ex$FullFilePath <- NULL  
all\_dt\_ex$ROIFilePath <- NULL  
  
all\_dt\_ex$LeftOrRightBrest <- as.numeric(all\_dt\_ex$LeftOrRightBrest)  
all\_dt\_ex$LeftOrRightBrest <- cut(all\_dt\_ex$LeftOrRightBrest, 2, labels=c('LEFT', 'RIGHT'))  
all\_dt\_ex$LeftOrRightBrest <- NULL  
  
all\_dt\_ex$ImageView <- as.numeric(all\_dt\_ex$ImageView)  
all\_dt\_ex$ImageView <- cut(all\_dt\_ex$ImageView, 2, labels=c('CC', 'MLO'))  
all\_dt\_ex$ImageView <- NULL  
  
all\_dt\_ex$TestOrTraining <- NULL  
  
tibble(all\_dt\_ex)

## # A tibble: 1,311 x 9  
## BrestDensity CalcType CalcDistribution Patology LesionVolume LesionArea  
## <int> <fct> <fct> <fct> <dbl> <dbl>  
## 1 2 PUNCTAT~ CLUSTERED BENIGN 95.4 2.34  
## 2 2 PUNCTAT~ CLUSTERED BENIGN 92.8 2.29  
## 3 4 PLEOMOR~ CLUSTERED BENIGN 97.6 2.43  
## 4 4 PLEOMOR~ CLUSTERED BENIGN 86.8 2.17  
## 5 4 AMORPHO~ SEGMENTAL BENIGN 608. 13.4   
## 6 2 PLEOMOR~ CLUSTERED MALIGNA~ 122. 2.97  
## 7 2 PLEOMOR~ CLUSTERED MALIGNA~ 106. 2.63  
## 8 1 AMORPHO~ CLUSTERED BENIGN 191. 4.44  
## 9 3 PLEOMOR~ CLUSTERED MALIGNA~ 56.6 1.47  
## 10 1 PLEOMOR~ CLUSTERED BENIGN 73.1 1.86  
## # ... with 1,301 more rows, and 3 more variables: SphericalDisproportion <dbl>,  
## # Sphericity <dbl>, SurfaceToVolumeRatio <dbl>

After that, it should be checked is there missing values in dataset.

## BrestDensity CalcType CalcDistribution   
## 0 0 0   
## Patology LesionVolume LesionArea   
## 0 0 0   
## SphericalDisproportion Sphericity SurfaceToVolumeRatio   
## 0 0 0

Obtained result indicate that thete is no misisng values. Therefore, there is no need to correct existng data.

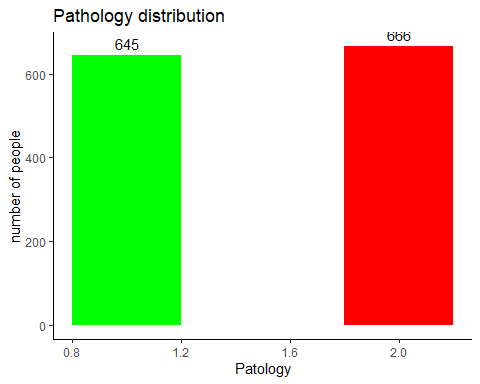
### Data exploration

Since the research question is to predict if the patient has malignant changes, so variable “pathology” to be the dependent variable in this analysis. That variable is treated as a discrete attribute and its prediction will be executed as classification process.

Firstly, distribution of “pathology” is examinated.

## [1] "pathology"

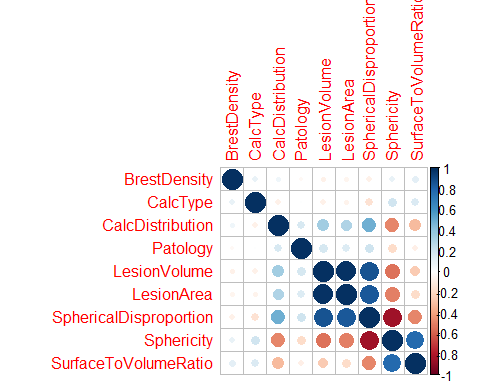
## .  
## 1 2   
## 645 666



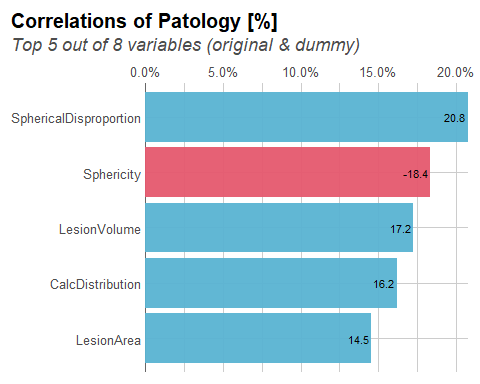
Corelation among variables in dataset is calculated and displayed on the following diagram.

## BrestDensity CalcType CalcDistribution Patology  
## BrestDensity 1.000 0.091 0.065 -0.034  
## CalcType 0.091 1.000 -0.076 0.009  
## CalcDistribution 0.065 -0.076 1.000 0.162  
## Patology -0.034 0.009 0.162 1.000  
## LesionVolume -0.070 -0.077 0.343 0.172  
## LesionArea -0.058 -0.064 0.301 0.145  
## SphericalDisproportion -0.077 -0.156 0.484 0.208

## Sphericity 0.093 0.196 -0.483 -0.184  
## SurfaceToVolumeRatio 0.118 0.150 -0.312 -0.083  
## LesionVolume LesionArea SphericalDisproportion  
## BrestDensity -0.070 -0.058 -0.077  
## CalcType -0.077 -0.064 -0.156  
## CalcDistribution 0.343 0.301 0.484  
## Patology 0.172 0.145 0.208  
## LesionVolume 1.000 0.983 0.861  
## LesionArea 0.983 1.000 0.848  
## SphericalDisproportion 0.861 0.848 1.000  
## Sphericity -0.543 -0.503 -0.850  
## SurfaceToVolumeRatio -0.251 -0.189 -0.485  
## Sphericity SurfaceToVolumeRatio  
## BrestDensity 0.093 0.118  
## CalcType 0.196 0.150  
## CalcDistribution -0.483 -0.312  
## Patology -0.184 -0.083  
## LesionVolume -0.543 -0.251  
## LesionArea -0.503 -0.189  
## SphericalDisproportion -0.850 -0.485  
## Sphericity 1.000 0.777  
## SurfaceToVolumeRatio 0.777 1.000



In this diagram, positive corelation is marked with different shades of blue, while negative correlation is marked with different shades of red. More intesive color indicate that correlation is higher.



### Models

Different Machine Learning models were chosen for predicting the “target” variable. Here is the list of models that are used in this report:

* k Nearest Neihbours (**k-nn**), described in (Murphy [2012](#ref-murphy), 16–18). An object is classified by a plurality vote of its neighbors, with the object being assigned to the class most common among its k nearest neighbors (k is a positive integer, typically small). I
* Naive Bayes (**nb**), explained in (Murphy [2012](#ref-murphy), 82–95). It is simple “probabilistic classifier” based on applying Bayes’ theorem, with strong (e.g. naïve) assumptions of independence between the features. In other words, naive Bayes classifier assume that the value of a particular feature is independent of the value of any other feature, given the class variable.
* SVM with Linear Kernel (**svm-l**), described in (Murphy [2012](#ref-murphy), 482–86). Training algorithm of SVM builds a model that assigns new examples to one category or the other, making it a non-probabilistic binary linear classifier.
* SVM with Radial Kernel (**svm-r**), also described in (Murphy [2012](#ref-murphy), 498–505). It is using the kernel trick, which implicitly maps kernel inputs into high-dimensional feature spaces where features are linearly separable. In this case kernel is defined with Gaussian radial basis function, given by formula:
* Random Forest (**rf**), also described in (Murphy [2012](#ref-murphy), 550–53). Random forest operate by constructing a multitude of decision trees at training time and outputting the value that is mean/average prediction of the individual trees.

### Implementation and evaluation

It is clear that various different alternatives and experiments should be created during ML process implementation.

Because of its popularity, efficiency, simplicity and flexibility and because of author’s previous experience, R language and environment for statistical computing and graphics (R Core Team [2019](#ref-rfoundations)) is used to implement the ML process. A decision tree is a flowchart-like structure in which each internal node represents a “test” on an attribute, each branch represents the outcome of the test, and each leaf node represents a class label (decision taken after computing all attributes). It is clear that paths from root to leaf represent classification rules.

The following ML predictor models are developed with R functions:

* Function ‘knn’(R Documentation team, [n.d.](#ref-rfunknn)) in library ‘class’(B. Ripley [2020](#ref-rbibclass)) is used for k-nn model realization.
* Function ‘NaiveBayes’(R Documentation team, [n.d.](#ref-rfunnaivebayes)) in library ‘klaR’(C. Roever [2020](#ref-rbibklar)) is used for nb model realization.
* Function ‘ksvm’ (R Documentation team, [n.d.](#ref-rfunkvsm)) in library ‘kernlab’(A. Karatzoglou [2019](#ref-rbibkernlab)) with parameter kernel = vanilladot() that represents linear kernel, is used for svm-l model realization.
* Function ‘ksvm’in library ’kernlab’ with parameter kernel = “rbfdot” - which represents radial kernel, is used for svm-r model realization.
* Function ‘randomForest’(R Documentation team, [n.d.](#ref-rfunrandomforest)) in library ‘randomForest’(L. Breiman [2018](#ref-rbibrandomforest)) is used for rf model realization.

Last, but not the least, R function ‘train’ (R Documentation team, [n.d.](#ref-rfuntrain)) in library ‘caret’ (M. Kuhn [2020](#ref-rbibcaret)) is used as umbrella that covers all the previously mentioned R functions and libraries for ML. They enables handling of a various learning models and functions in a uniform manner. In this moment, more than 230 classification and regression models are ‘out-of-a-box’ available for use with ‘caret’ and all of them are enlisted in (Kuhn, [n.d.](#ref-kuhnam)).

Developed models are compared using k-fold validation (Murphy [2012](#ref-murphy), 201–10), with value of parameter k is set to 10. Selected 10-fold validation is realized with caret R functions. In order to achieve exactly the same conditions for comparison among developed ML methods, in all 10-fold validation scenarios, random generator is set on predefined value 155294099.

In order to evaluate quality of the selected ML regression methods, various measures (Murphy [2012](#ref-murphy), 176–94) are used.

The following overall measures are calculated for ML models:

For measuring the performance of algorithms, sensitivity (or recall), specificity and accuracy were used because these three criteria are used more in the medical field.

For calculation of sensitivity, specificity and accuracy confusion matrix is required. In the following table, a confusion matrix is shown:

|  |  |  |
| --- | --- | --- |
|  | Actual class is C1 | Actual class is C2 |
| Predicted class is *C1* | True positive () | False positive () |
| Predicted class is *C2* | False negative () | True negative () |

Cells in confusion matrix have the following meaning (R. Alizadehsani [2019](#ref-alizedah2019)): - Actual class is the class which determined by angiography and it is existed in dataset. - Predicted class is the one which is predicted by algorithms. - is number of samples of class C1 which has been correctly classified. - is number of samples of class C2 which has been correctly classified. - is number of samples of class C1 which has been falsely classified as C2. - is number of samples of class C2 which has been falsely classified as C1.

According to confusion matrix, sensitivity, specificity and accuracy are calculated as follows:

Quality of the classification algorithm is often displayed by ROC (receiver operating characteristic) curve. It is a diagram showing the performance of a classification model at all classification thresholds. This curve plots two parameters true positive rate () and false positive rate ().

True Positive Rate () is a synonym for recall and is defined as follows:

False Positive Rate () is defined as follows:

An ROC curve plots vs. at different classification thresholds. Lowering the classification threshold classifies more items as positive, thus increasing both false positives and true positives.

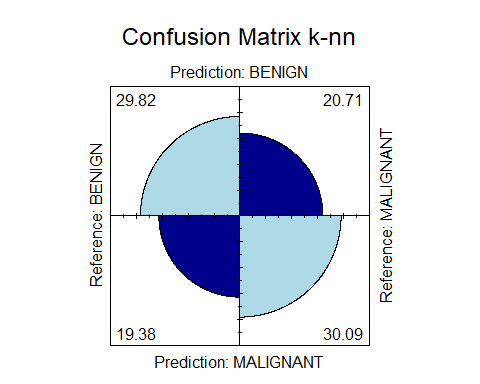
Area Under the ROC Curve (AUC) measures the entire two-dimensional area underneath the entire ROC curve (think integral calculus) from (0,0) to (1,1).

Display info about k-nn model after 10-fold validation:

## 9-nearest neighbor model  
## Training set outcome distribution:  
##   
## BENIGN MALIGNANT   
## 645 666

## [1] 0.6331803 0.6374126 0.5873708 0.6985774 0.6374290 0.7316931 0.6724580  
## [8] 0.5504662 0.6178322 0.6105410 0.6889782 0.6326959 0.6729604 0.7019518  
## [15] 0.6955711 0.6778218 0.5801373 0.6712831 0.6161883 0.5573694 0.6244755  
## [22] 0.5650653 0.6275058 0.6552448 0.6153846 0.7817164 0.6359608 0.6640625  
## [29] 0.5979334 0.6703789 0.6820196 0.6118881 0.6774384 0.6284382 0.5105350  
## [36] 0.5867661 0.7001657 0.7324914 0.6300699 0.6011481 0.5852379 0.6288479  
## [43] 0.6117107 0.6041278 0.6466131 0.6793377 0.6020979 0.6497130 0.5903685  
## [50] 0.6142724 0.6406250 0.6066434 0.6245921 0.6470723 0.6473881 0.6289062  
## [57] 0.6758898 0.7026515 0.6344432 0.5870028 0.6167623 0.6190586 0.5979021  
## [64] 0.5891335 0.6613088 0.7676373 0.6022962 0.6468050 0.6779720 0.7779564  
## [71] 0.6364820 0.6087256 0.6253551 0.6670942 0.5670476 0.5775058 0.6243590  
## [78] 0.6529277 0.6678530 0.6063146 0.5865205 0.6575201 0.6837995 0.6967853  
## [85] 0.6210938 0.6239347 0.6255830 0.6842710 0.5686480 0.6102036 0.6373601  
## [92] 0.5722948 0.6486014 0.7602612 0.6444729 0.5872396 0.6126399 0.6691931  
## [99] 0.6562500 0.5770396

## Cross-Validated (10 fold, repeated 10 times) Confusion Matrix   
##   
## (entries are percentual average cell counts across resamples)  
##   
## Reference  
## Prediction BENIGN MALIGNANT  
## BENIGN 29.8 20.7  
## MALIGNANT 19.4 30.1  
##   
## Accuracy (average) : 0.5991



## [1] 0.5923423

## [1] 0.6060465

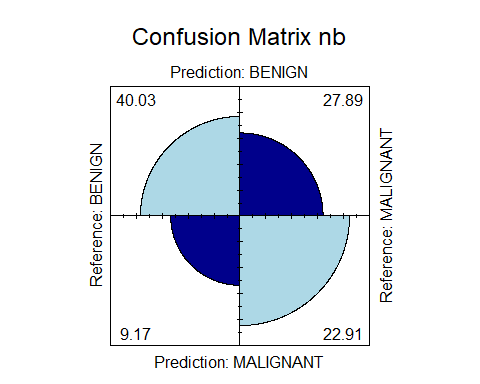
## [1] 0.5990847

Display info about nb model after 10-fold validation:

## $apriori  
## grouping  
## BENIGN MALIGNANT   
## 0.4919908 0.5080092   
##   
## $tables  
## $tables$BrestDensity  
## $tables$BrestDensity$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 0.2325  
##   
## x y   
## Min. :0.3024 Min. :0.001372   
## 1st Qu.:1.4012 1st Qu.:0.084890   
## Median :2.5000 Median :0.162937   
## Mean :2.5000 Mean :0.227182   
## 3rd Qu.:3.5988 3rd Qu.:0.390467   
## Max. :4.6976 Max. :0.539886   
##   
## $tables$BrestDensity$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 0.2199  
##   
## x y   
## Min. :-0.6596 Min. :0.0000614   
## 1st Qu.: 0.6702 1st Qu.:0.0167508   
## Median : 2.0000 Median :0.1042738   
## Mean : 2.0000 Mean :0.1877535   
## 3rd Qu.: 3.3298 3rd Qu.:0.3326793   
## Max. : 4.6596 Max. :0.6589046   
##   
##   
## $tables$CalcType  
## $tables$CalcType$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 1.244  
##   
## x y   
## Min. :-2.732 Min. :1.128e-05   
## 1st Qu.: 4.884 1st Qu.:6.784e-03   
## Median :12.500 Median :1.257e-02   
## Mean :12.500 Mean :3.279e-02   
## 3rd Qu.:20.116 3rd Qu.:3.870e-02   
## Max. :27.732 Max. :1.875e-01   
##   
## $tables$CalcType$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 0.9605  
##   
## x y   
## Min. :-1.881 Min. :7.030e-06   
## 1st Qu.: 5.059 1st Qu.:3.228e-03   
## Median :12.000 Median :1.272e-02   
## Mean :12.000 Mean :3.598e-02   
## 3rd Qu.:18.941 3rd Qu.:3.689e-02   
## Max. :25.881 Max. :2.702e-01   
##   
##   
## $tables$CalcDistribution  
## $tables$CalcDistribution$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 0.7613  
##   
## x y   
## Min. :-1.284 Min. :0.0006948   
## 1st Qu.: 2.108 1st Qu.:0.0133741   
## Median : 5.500 Median :0.0227009   
## Mean : 5.500 Mean :0.0735447   
## 3rd Qu.: 8.892 3rd Qu.:0.0608569   
## Max. :12.284 Max. :0.4136169   
##   
## $tables$CalcDistribution$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 0.732  
##   
## x y   
## Min. :-1.196 Min. :0.001085   
## 1st Qu.: 2.152 1st Qu.:0.021150   
## Median : 5.500 Median :0.042757   
## Mean : 5.500 Mean :0.074524   
## 3rd Qu.: 8.848 3rd Qu.:0.082770   
## Max. :12.196 Max. :0.334919   
##   
##   
## $tables$LesionVolume  
## $tables$LesionVolume$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 62.1  
##   
## x y   
## Min. : -178.1 Min. :0.000e+00   
## 1st Qu.: 5009.5 1st Qu.:0.000e+00   
## Median :10197.1 Median :0.000e+00   
## Mean :10197.1 Mean :4.812e-05   
## 3rd Qu.:15384.7 3rd Qu.:2.574e-06   
## Max. :20572.3 Max. :2.396e-03   
##   
## $tables$LesionVolume$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 186.6  
##   
## x y   
## Min. : -556.4 Min. :0.000e+00   
## 1st Qu.: 5214.8 1st Qu.:1.100e-09   
## Median :10986.0 Median :1.743e-06   
## Mean :10986.0 Mean :4.325e-05   
## 3rd Qu.:16757.2 3rd Qu.:1.468e-05   
## Max. :22528.5 Max. :1.011e-03   
##   
##   
## $tables$LesionArea  
## $tables$LesionArea$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 1.341  
##   
## x y   
## Min. : -3.721 Min. :0.000000   
## 1st Qu.:164.620 1st Qu.:0.000000   
## Median :332.962 Median :0.000000   
## Mean :332.962 Mean :0.001483   
## 3rd Qu.:501.303 3rd Qu.:0.000000   
## Max. :669.645 Max. :0.105701   
##   
## $tables$LesionArea$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 4.053  
##   
## x y   
## Min. :-11.99 Min. :0.000e+00   
## 1st Qu.:129.59 1st Qu.:0.000e+00   
## Median :271.18 Median :3.925e-05   
## Mean :271.18 Mean :1.765e-03   
## 3rd Qu.:412.77 3rd Qu.:5.887e-04   
## Max. :554.35 Max. :4.648e-02   
##   
##   
## $tables$SphericalDisproportion  
## $tables$SphericalDisproportion$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 0.0001827  
##   
## x y   
## Min. :0.0006667 Min. : 0.000   
## 1st Qu.:0.0047409 1st Qu.: 0.000   
## Median :0.0088152 Median : 1.021   
## Mean :0.0088152 Mean : 61.301   
## 3rd Qu.:0.0128894 3rd Qu.: 19.865   
## Max. :0.0169637 Max. :583.307   
##   
## $tables$SphericalDisproportion$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 0.0003441  
##   
## x y   
## Min. :0.0002021 Min. : 0.016   
## 1st Qu.:0.0033761 1st Qu.: 1.458   
## Median :0.0065501 Median : 17.187   
## Mean :0.0065501 Mean : 78.686   
## 3rd Qu.:0.0097242 3rd Qu.:129.156   
## Max. :0.0128982 Max. :362.912   
##   
##   
## $tables$Sphericity  
## $tables$Sphericity$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 31.4  
##   
## x y   
## Min. :-33.27 Min. :2.250e-07   
## 1st Qu.:204.39 1st Qu.:4.819e-05   
## Median :442.06 Median :6.654e-04   
## Mean :442.06 Mean :1.051e-03   
## 3rd Qu.:679.72 3rd Qu.:1.821e-03   
## Max. :917.38 Max. :3.301e-03   
##   
## $tables$Sphericity$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 36.99  
##   
## x y   
## Min. :-26.69 Min. :3.844e-07   
## 1st Qu.:210.26 1st Qu.:1.389e-04   
## Median :447.21 Median :9.971e-04   
## Mean :447.21 Mean :1.054e-03   
## 3rd Qu.:684.16 3rd Qu.:1.870e-03   
## Max. :921.11 Max. :2.668e-03   
##   
##   
## $tables$SurfaceToVolumeRatio  
## $tables$SurfaceToVolumeRatio$BENIGN  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (645 obs.); Bandwidth 'bw' = 0.0005583  
##   
## x y   
## Min. :0.01891 Min. : 0.01566   
## 1st Qu.:0.02429 1st Qu.: 1.34523   
## Median :0.02967 Median : 7.89618   
## Mean :0.02967 Mean : 46.44101   
## 3rd Qu.:0.03505 3rd Qu.: 69.69501   
## Max. :0.04043 Max. :213.77942   
##   
## $tables$SurfaceToVolumeRatio$MALIGNANT  
##   
## Call:  
## density.default(x = xx, adjust = ..1)  
##   
## Data: xx (666 obs.); Bandwidth 'bw' = 0.0006193  
##   
## x y   
## Min. :0.01859 Min. : 0.00004   
## 1st Qu.:0.02657 1st Qu.: 0.36977   
## Median :0.03454 Median : 2.21571   
## Mean :0.03454 Mean : 31.31634   
## 3rd Qu.:0.04252 3rd Qu.: 29.68035   
## Max. :0.05049 Max. :216.01950   
##   
##   
##   
## $levels  
## [1] "BENIGN" "MALIGNANT"  
##   
## $call  
## NaiveBayes.default(x = x, grouping = y, usekernel = TRUE, fL = param$fL,   
## adjust = param$adjust)  
##   
## $x  
## BrestDensity CalcType CalcDistribution LesionVolume LesionArea  
## X1 2 19 1 95.4425 2.34285  
## X2 2 19 1 92.8025 2.29005  
## X3 4 11 1 97.5525 2.42505  
## X4 4 11 1 86.7525 2.16905  
## X5 4 1 10 608.0525 13.38705  
## X6 2 11 1 121.7725 2.96545  
## X7 2 11 1 105.6125 2.63425  
## X8 1 1 1 190.8025 4.44205  
## X9 3 11 1 56.6325 1.47065  
## X10 1 11 1 73.0525 1.85505  
## X11 4 11 1 43.2725 1.16345  
## X12 1 1 1 317.7125 7.18825  
## X13 1 11 1 74.0525 1.88305  
## X14 4 1 10 1378.8525 29.26705  
## X15 4 11 1 642.7750 16.69150  
## X16 4 1 10 1084.4325 23.23365  
## X17 4 11 1 569.2225 12.49045  
## X18 1 11 2 2328.0625 52.67125  
## X19 1 11 2 1433.0125 33.12525  
## X20 4 11 1 208.7125 4.83225  
## X21 4 15 1 40.2025 1.10605  
## X22 1 11 1 34.7025 1.03005  
## X23 2 11 1 127.2025 3.07405  
## X24 4 11 10 1049.4825 22.47965  
## X25 2 11 1 174.4725 4.09145  
## X26 4 7 10 1147.9825 25.28165  
## X27 4 11 1 266.0525 6.05905  
## X28 4 7 10 1197.4825 26.02365  
## X29 4 11 1 277.4825 6.32765  
## X30 3 11 1 48.9725 1.31745  
## X31 3 11 1 94.3925 2.33785  
## X32 2 11 1 221.0425 5.09485  
## X33 2 11 1 152.7125 3.63225  
## X34 4 11 1 233.6625 5.37125  
## X35 3 1 10 897.6025 19.31405  
## X36 3 12 1 17034.3125 560.50925  
## X37 3 11 1 20386.0525 665.62205  
## X38 3 1 10 1231.1575 47.29615  
## X39 3 7 1 720.6050 15.70210  
## X40 3 7 1 980.4925 20.99585  
## X41 2 11 1 1038.3625 22.28925  
## X42 4 11 1 71.3525 1.81405  
## X43 2 11 1 465.9925 10.36185  
## X44 2 10 5 1116.3125 24.14425  
## X45 2 10 5 1441.7725 30.89345  
## X46 3 1 10 1211.2400 29.46580  
## X47 3 1 10 1119.1225 23.88045  
## X48 4 11 1 108.9025 2.66805  
## X49 3 11 1 169.2375 3.96275  
## X50 3 11 10 530.9725 11.78145  
## X51 3 11 10 908.4225 19.58645  
## X52 4 13 10 1005.7550 21.78710  
## X53 3 11 1 3519.5950 80.49590  
## X54 2 11 1 47.0125 1.24625  
## X55 3 1 1 357.1525 8.00905  
## X56 4 15 1 501.9150 11.08030  
## X57 3 1 1 539.7200 11.89240  
## X58 3 11 10 201.7475 4.78595  
## X59 3 7 5 219.5525 5.25105  
## X60 3 16 1 340.0925 7.66785  
## X61 3 11 10 251.4200 5.87540  
## X62 3 7 5 143.1525 3.53005  
## X63 3 11 10 408.4775 9.22655  
## X64 3 1 5 141.6500 5.43700  
## X65 3 11 10 418.8525 9.58405  
## X66 3 1 5 298.6625 11.57325  
## X67 2 11 1 389.9200 8.70440  
## X68 2 11 1 664.5975 14.46995  
## X69 4 11 10 4448.8525 92.21105  
## X70 2 7 2 46.5625 1.24525  
## X71 2 7 2 36.6025 1.02205  
## X72 2 11 1 538.5150 11.95730  
## X73 2 11 1 735.5150 15.98730  
## X74 4 11 1 85.9250 2.23650  
## X75 2 11 1 145.2625 3.48325  
## X76 2 1 1 440.6125 9.78225  
## X77 2 1 1 692.6525 15.02305  
## X78 4 1 4 417.0225 9.33445  
## X79 4 11 1 111.6925 2.80385  
## X80 4 11 1 155.3125 3.72325  
## X81 3 11 1 110.0325 2.69065  
## X82 3 11 1 137.1125 3.28025  
## X83 4 11 1 51.0025 1.35005  
## X84 3 11 1 107.5325 2.64065  
## X85 4 1 8 3730.1525 77.40505  
## X86 4 11 1 50.4325 1.33865  
## X87 3 11 1 104.7825 2.56965  
## X88 3 1 10 1227.8500 26.27100  
## X89 3 1 10 1029.9125 22.04825  
## X90 4 11 1 54.5525 1.42905  
## X91 4 11 1 54.6425 1.43085  
## X92 3 7 5 130.8525 3.24305  
## X93 3 7 5 148.5625 3.62125  
## X94 4 19 1 49.3525 1.31705  
## X95 2 11 1 42.3925 1.17785  
## X96 4 15 1 46.0000 1.23400  
## X97 2 11 1 34.7425 0.97685  
## X98 3 11 5 60.4325 1.57865  
## X99 3 11 5 122.9325 3.00465  
## X100 2 19 1 227.9025 5.24005  
## X101 4 1 1 304.2025 6.91805  
## X102 4 1 1 316.7925 7.19385  
## X103 2 19 1 722.3625 15.73725  
## X104 3 22 1 30.9325 0.90065  
## X105 3 16 1 38.1225 1.05245  
## X106 2 11 1 300.8425 6.82685  
## X107 4 7 10 284.6150 6.70230  
## X108 2 11 1 266.7525 6.06505  
## X109 3 11 1 105.5425 2.60085  
## X110 3 11 1 94.6075 2.39715  
## X111 2 11 1 139.2825 3.47565  
## X112 4 11 1 58.2825 1.52465  
## X113 2 11 1 145.2450 3.64890  
## X114 4 11 1 53.5600 1.40720  
## X115 2 11 1 55.2625 1.49925  
## X116 4 11 1 90.9650 2.27030  
## X117 2 1 1 78.8725 1.97145  
## X118 4 11 10 1619.8925 34.24785  
## X119 3 11 5 199.8825 4.76765  
## X120 3 11 5 205.9825 4.88165  
## X121 3 11 1 118.7525 2.91205  
## X122 4 11 10 1144.4525 24.70705  
## X123 4 11 1 373.5225 8.41645  
## X124 4 11 1 222.6225 5.16645  
## X125 2 11 1 85.2250 2.28450  
## X126 2 15 1 591.7500 12.93200  
## X127 2 11 1 95.8575 2.53315  
## X128 2 15 1 506.4675 11.13935  
## X129 4 15 1 59.6875 1.56275  
## X130 3 11 1 135.9925 3.30585  
## X131 3 11 1 190.4425 4.47485  
## X132 4 15 1 52.7950 1.42490  
## X133 4 11 1 381.5625 8.57725  
## X134 3 11 1 42.1025 1.15605  
## X135 4 11 1 844.1225 18.23545  
## X136 4 1 10 540.4125 11.88225  
## X137 3 11 1 174.0225 4.05845  
## X138 3 11 1 313.7425 7.06885  
## X139 4 1 10 770.9225 16.72445  
## X140 3 11 1 176.6325 4.13465  
## X141 3 11 1 83.4025 2.11005  
## X142 3 11 1 163.1225 3.88845  
## X143 3 11 1 85.2700 2.13940  
## X144 4 11 1 474.7950 13.49990  
## X145 4 11 1 326.1125 7.38025  
## X146 3 7 5 121.4000 2.95600  
## X147 3 7 5 168.3700 4.00240  
## X148 3 11 1 41.5000 1.15100  
## X149 2 7 10 333.7950 7.86590  
## X150 2 7 10 378.9275 8.73455  
## X151 4 11 1 82.4325 2.06665  
## X152 4 11 1 26.3775 0.79955  
## X153 3 11 1 375.6825 8.41965  
## X154 4 11 1 59.9400 1.60080  
## X155 3 11 1 576.2225 12.63045  
## X156 1 1 1 2478.7900 51.84180  
## X157 1 1 1 1426.6050 30.20710  
## X158 3 15 1 23.6425 0.69885  
## X159 3 11 1 25.2225 0.75445  
## X160 4 11 5 243.7425 5.87685  
## X161 2 7 1 963.6525 20.71505  
## X162 2 7 1 1067.7325 22.89265  
## X163 3 11 1 369.7925 8.26185  
## X164 4 11 1 32.6875 0.91075  
## X165 4 11 1 32.9700 0.93240  
## X166 3 11 1 285.0025 6.53705  
## X167 3 11 1 543.4400 12.07980  
## X168 3 11 1 78.6125 1.99025  
## X169 2 11 1 170.1825 4.00565  
## X170 2 11 1 145.0725 3.47945  
## X171 1 11 1 64.4250 1.64250  
## X172 1 11 1 137.6925 3.27585  
## X173 3 2 1 145.6525 3.49105  
## X174 1 11 1 918.7025 19.90405  
## X175 1 11 1 521.0125 11.67825  
## X176 2 11 1 80.7025 2.03205  
## X177 2 2 1 78.5025 1.98005  
## X178 2 1 1 270.7075 6.14315  
## X179 2 11 1 78.7125 1.98325  
## X180 2 1 1 160.6825 3.81565  
## X181 2 11 1 142.7725 3.41745  
## X182 3 17 1 125.3825 3.05365  
## X183 3 15 10 847.9225 18.30445  
## X184 3 15 10 935.1825 20.09765  
## X185 3 1 1 482.3725 10.65745  
## X186 3 17 1 33.6025 0.95405  
## X187 4 1 1 353.5825 8.07365  
## X188 0 11 4 2473.6350 52.29870  
## X189 4 1 1 317.6225 7.21045  
## X190 0 11 4 2970.6850 64.88270  
## X191 1 11 1 234.9525 5.45305  
## X192 4 11 1 389.1125 8.80025  
## X193 1 11 1 388.2825 8.66365  
## X194 2 1 1 485.3925 10.73385  
## X195 2 1 10 631.1625 13.80925  
## X196 2 11 5 707.4825 15.49565  
## X197 4 1 1 45.5125 1.21625  
## X198 4 11 1 111.2725 2.74745  
## X199 2 11 1 45.3025 1.22005  
## X200 2 11 1 19.7525 0.60505  
## X201 4 15 1 22.0525 0.66705  
## X202 4 15 1 20.5325 0.61265  
## X203 2 11 1 363.6425 8.14685  
## X204 2 11 1 427.7600 9.48520  
## X205 4 11 1 45.4300 1.21460  
## X206 4 11 1 32.5850 0.92470  
## X207 2 11 1 159.0725 3.79145  
## X208 2 11 1 102.0525 2.53905  
## X209 2 13 6 1499.1175 32.50335  
## X210 2 13 6 1392.1125 30.02825  
## X211 2 11 10 4060.4275 88.89455  
## X212 2 7 5 230.8625 5.31925  
## X213 2 7 5 742.7600 16.12920  
## X214 2 1 1 390.9625 8.70125  
## X215 2 11 10 3623.0725 75.26345  
## X216 2 1 1 339.9975 7.64995  
## X217 2 1 1 341.0125 7.66225  
## X218 2 1 1 222.3825 5.12965  
## X219 3 7 1 837.4675 18.05535  
## X220 4 2 8 7028.7950 148.71290  
## X221 4 2 8 6922.9100 144.61420  
## X222 3 7 1 1361.5325 28.89665  
## X223 2 1 10 4850.8575 114.64115  
## X224 2 1 10 3096.8675 64.84235  
## X225 3 7 5 2432.0825 50.94765  
## X226 2 11 1 836.0325 18.00665  
## X227 3 7 5 2038.8375 42.90275  
## X228 2 11 1 1191.1875 25.40575  
## X229 2 1 1 948.7175 20.36435  
## X230 2 15 1 774.6275 16.74555  
## X231 2 7 1 1860.8625 39.25925  
## X232 4 15 1 362.1050 8.91010  
## X233 2 7 1 3421.6975 71.08395  
## X234 3 11 1 720.2725 15.61545  
## X235 3 11 1 434.6225 9.64645  
## X236 4 15 1 159.6575 4.62915  
## X237 3 1 1 706.5525 15.32105  
## X238 3 1 1 594.2825 13.03565  
## X239 4 11 5 649.0925 14.15985  
## X240 4 11 5 865.8025 18.68605  
## X241 3 11 1 152.4725 3.73145  
## X242 2 11 1 1442.7125 30.59225  
## X243 2 11 1 1470.5525 31.17305  
## X244 4 11 10 622.1925 13.57385  
## X245 3 11 1 89.1925 2.27385  
## X246 4 11 1 157.2725 3.73945  
## X247 4 11 1 342.6925 7.77585  
## X248 4 11 1 287.2925 6.57985  
## X249 4 11 1 565.3625 12.39725  
## X250 4 11 1 92.0725 2.29945  
## X251 2 11 1 210.8125 4.88225  
## X252 2 11 1 212.7225 4.90445  
## X253 3 11 1 279.4025 6.34205  
## X254 4 15 1 43.4425 1.18285  
## X255 4 11 1 1055.0525 22.59905  
## X256 3 1 1 239.2825 5.49165  
## X257 4 15 1 39.2425 1.09885  
## X258 4 11 1 22.5425 0.66885  
## X259 3 11 1 92.4825 2.29965  
## X260 3 11 1 68.1125 1.74825  
## X261 4 11 1 43.0825 1.15965  
## X262 3 11 1 173.3025 4.15605  
## X263 3 11 10 1270.7225 27.15245  
## X264 2 7 2 17.0825 0.53565  
## X265 3 11 1 427.6225 9.50645  
## X266 2 7 2 21.3625 0.63725  
## X267 4 11 1 172.8525 4.06705  
## X268 4 11 1 108.3725 2.66545  
## X269 3 11 1 141.1225 3.37745  
## X270 3 1 1 174.9225 4.09245  
## X271 3 1 1 154.3625 3.64925  
## X272 2 11 1 146.7225 3.51945  
## X273 3 11 1 153.7625 3.67725  
## X274 2 11 1 114.5925 2.81385  
## X275 2 11 1 202.4500 4.70700  
## X276 2 11 1 148.0125 3.53025  
## X277 2 11 1 229.9325 5.29665  
## X278 2 11 1 142.4125 3.47425  
## X279 4 11 1 83.1925 2.08185  
## X280 3 11 10 495.7650 11.33130  
## X281 2 15 1 895.4550 19.50010  
## X282 3 11 10 375.6325 8.58165  
## X283 4 1 1 31.8775 0.90955  
## X284 2 11 1 707.3975 15.65295  
## X285 4 1 1 47.8150 1.26330  
## X286 3 11 1 370.2725 8.28745  
## X287 3 11 1 500.6825 11.04765  
## X288 3 11 1 1161.8425 24.91885  
## X289 3 11 1 1110.0300 30.28460  
## X290 3 15 1 316.1225 7.16445  
## X291 3 15 1 479.5725 10.58545  
## X292 2 19 1 71.2225 1.81845  
## X293 2 19 1 74.5325 1.87665  
## X294 3 11 1 105.4425 2.60685  
## X295 3 11 1 90.6625 2.23125  
## X296 2 1 1 398.3425 8.86485  
## X297 3 15 1 149.6600 3.64020  
## X298 3 7 1 264.1625 6.05325  
## X299 2 1 1 350.5600 7.86120  
## X300 3 13 1 65.9725 1.70545  
## X301 3 13 1 37.9625 1.04125  
## X302 4 1 10 1249.4525 26.66305  
## X303 4 11 10 1537.9025 32.72005  
## X304 2 7 5 71.0750 1.89150  
## X305 2 7 5 87.2725 2.19145  
## X306 3 11 1 188.9425 4.46085  
## X307 4 11 1 182.6225 4.37445  
## X308 3 11 1 413.7225 9.41245  
## X309 4 11 1 180.6825 4.34365  
## X310 3 1 1 182.9925 4.27785  
## X311 2 1 1 479.9325 10.56065  
## X312 2 1 1 282.6225 6.43045  
## X313 2 11 1 95.5525 2.38505  
## X314 2 11 1 115.0125 2.84625  
## X315 3 7 1 216.0650 5.01830  
## X316 4 11 1 255.2225 5.83445  
## X317 4 11 1 242.2125 5.59825  
## X318 4 11 1 23.2025 0.67405  
## X319 4 11 1 20.7425 0.62485  
## X320 1 11 10 1294.6825 27.63965  
## X321 1 11 10 703.0925 15.34485  
## X322 3 11 10 2288.4625 49.27125  
## X323 3 11 1 827.4825 17.89565  
## X324 3 1 1 176.1725 4.13345  
## X325 3 11 1 726.0925 15.72385  
## X326 4 15 1 54.5225 1.44445  
## X327 3 11 1 687.9525 14.98505  
## X328 4 15 8 1374.3000 29.32700  
## X329 4 15 1 66.9025 1.72405  
## X330 3 1 1 203.6325 4.73865  
## X331 4 15 8 1092.2725 23.46545  
## X332 4 11 1 14.3025 0.46405  
## X333 3 11 1 207.7825 4.80565  
## X334 3 11 1 318.6125 7.17425  
## X335 3 11 1 110.6825 2.73465  
## X336 4 11 10 476.5125 10.53225  
## X337 4 11 10 910.0925 19.77185  
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## X340 2 11 1 97.3925 2.40585  
## X341 2 1 4 3741.0125 78.23725  
## X342 2 11 10 16317.2550 345.66210  
## X343 2 11 10 21004.7050 521.76910  
## X344 3 11 1 109.3025 2.73205  
## X345 2 1 4 5215.4425 107.79085  
## X346 3 11 1 104.8425 2.57085  
## X347 4 15 10 612.4325 13.74665  
## X348 4 15 10 838.5025 18.21105  
## X349 1 1 8 4967.6850 102.72870  
## X350 1 1 8 4680.4800 96.62660  
## X351 3 11 1 76.3950 1.97790  
## X352 2 11 1 31.1025 0.88005  
## X353 3 11 1 213.3825 4.92565  
## X354 3 11 1 100.9825 2.49365  
## X355 3 11 1 87.3925 2.18985  
## X356 3 15 1 342.9550 8.61810  
## X357 2 11 10 781.9325 17.02465  
## X358 3 15 10 276.5950 7.16890  
## X359 2 11 10 938.1625 20.57325  
## X360 2 15 1 125.4425 3.08585  
## X361 2 15 1 158.0825 3.74765  
## X362 1 11 1 45.3025 1.25305  
## X363 3 11 3 123.1025 2.96805  
## X364 1 11 1 84.5025 2.14205  
## X365 3 11 1 115.2475 2.81795  
## X366 3 11 1 92.4525 2.27505  
## X367 3 11 3 150.6100 3.55820  
## X368 4 15 1 271.3525 6.19705  
## X369 4 15 1 132.3525 3.20105  
## X370 2 11 1 75.7025 1.95605  
## X371 2 11 1 238.0825 5.46765  
## X372 2 1 1 188.6925 4.37585  
## X373 2 15 10 1263.2325 26.89065  
## X374 2 11 1 66.3425 1.76885  
## X375 2 15 10 1158.0600 24.82120  
## X376 2 11 1 351.6575 7.97015  
## X377 3 11 1 130.6525 3.13505  
## X378 2 11 1 389.9500 8.71300  
## X379 4 11 10 926.5725 20.06145  
## X380 3 11 1 120.4025 2.91405  
## X381 4 11 1 44.4825 1.20365  
## X382 4 11 10 968.5025 22.78705  
## X383 4 11 10 886.2400 19.84680  
## X384 1 11 1 101.8400 2.53380  
## X385 2 1 10 473.4725 10.55145  
## X386 1 11 1 127.9650 3.12630  
## X387 2 1 10 1233.8925 26.40785  
## X388 4 11 1 185.7025 4.57205  
## X389 4 11 1 265.0725 6.03945  
## X390 4 11 1 17.1725 0.52945  
## X391 4 11 1 74.2125 1.88625  
## X392 4 11 1 70.8025 1.80205  
## X393 4 11 1 31.0025 0.87805  
## X394 2 1 1 291.4925 6.59985  
## X395 3 2 1 55.0925 1.43985  
## X396 3 1 1 48.8025 1.30605  
## X397 2 1 1 253.6225 5.81845  
## X398 2 20 1 131.7325 3.14065  
## X399 1 11 10 1303.3875 27.70575  
## X400 2 19 1 107.8825 2.61565  
## X401 3 1 1 685.8125 14.95825  
## X402 4 11 5 1037.0625 22.31925  
## X403 1 11 10 1222.7475 26.01695  
## X404 4 11 5 925.2600 20.04820  
## X405 4 15 1 185.4725 4.32745  
## X406 1 11 1 90.0325 2.21865  
## X407 4 15 1 187.2700 4.38740  
## X408 4 11 1 544.6825 11.98365  
## X409 1 11 1 151.1325 3.57665  
## X410 4 11 10 1678.1375 51.07775  
## X411 4 11 1 68.2225 1.75845  
## X412 4 11 1 53.4325 1.39865  
## X413 2 7 1 318.1025 7.18005  
## X414 2 7 1 233.4125 5.42225  
## X415 3 11 5 182.7600 4.31420  
## X416 3 11 5 90.4450 2.36090  
## X417 1 11 1 436.7950 9.71390  
## X418 2 15 10 968.8225 20.80245  
## X419 1 7 1 201.2775 4.96555  
## X420 3 15 1 17.8925 0.58385  
## X421 4 1 1 507.7125 11.16425  
## X422 4 1 1 421.9125 9.39225  
## X423 3 15 1 49.9075 1.34315  
## X424 3 11 5 130.9150 3.24030  
## X425 2 20 1 60.4275 1.58555  
## X426 3 11 1 89.4525 2.21505  
## X427 3 11 5 119.0775 2.88855  
## X428 3 11 1 97.1825 2.37765  
## X429 3 11 1 52.0325 1.38665  
## X430 3 11 1 50.8325 1.40165  
## X431 1 5 1 283.8025 6.44605  
## X432 1 5 1 233.4325 5.36665  
## X433 4 11 1 689.2925 15.04385  
## X434 4 11 8 278.9725 6.55745  
## X435 2 7 10 1749.7025 37.19605  
## X436 2 7 5 645.5125 14.25425  
## X437 3 11 1 317.8225 7.19045  
## X438 3 1 1 446.3925 9.89785  
## X439 3 11 1 236.1425 5.43685  
## X440 3 1 1 440.2825 9.74365  
## X441 3 4 1 226.7525 5.22105  
## X442 3 4 1 333.3775 7.48155  
## X443 3 11 1 63.4725 1.62945  
## X444 3 11 1 58.5425 1.52485  
## X445 3 11 1 42.4225 1.15445  
## X446 3 11 1 66.1025 1.69205  
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## X1199 0.006611308 151.25599 0.02064437  
## X1200 0.006989379 143.07423 0.02044985  
## X1201 0.003265223 306.25779 0.02172380  
## X1202 0.003378188 296.01664 0.02203437  
## X1203 0.003173156 315.14370 0.02154891  
## X1204 0.004909495 203.68693 0.02339564  
## X1205 0.005694681 175.60247 0.02205389  
## X1206 0.004329603 230.96806 0.02125774  
## X1207 0.002799833 357.16411 0.02250559  
## X1208 0.003439485 290.74117 0.02158920  
## X1209 0.003519197 284.15570 0.02350527  
## X1210 0.003263600 306.41006 0.02316660  
## X1211 0.005011030 199.55978 0.02095536  
## X1212 0.005125608 195.09879 0.02087970  
## X1213 0.004834118 206.86297 0.02095184  
## X1214 0.004037544 247.67534 0.02179607  
## X1215 0.004227853 236.52666 0.02120274  
## X1216 0.006698794 149.28061 0.02056993  
## X1217 0.006185685 161.66359 0.02071282  
## X1218 0.003386412 295.29780 0.02194319  
## X1219 0.002591271 385.91105 0.02263780  
## X1220 0.003128726 319.61891 0.02194905  
## X1221 0.005068628 197.29207 0.02082437  
## X1222 0.006360697 157.21548 0.02055681  
## X1223 0.002946293 339.40954 0.02183682  
## X1224 0.003168723 315.58457 0.02326229  
## X1225 0.002902187 344.56779 0.02186208  
## X1226 0.002864569 349.09266 0.02192196  
## X1227 0.003269439 305.86287 0.02181484  
## X1228 0.003186259 313.84765 0.02193511  
## X1229 0.003407917 293.43435 0.02168423  
## X1230 0.003531184 283.19116 0.02158235  
## X1231 0.002263092 441.87328 0.02447294  
## X1232 0.001955352 511.41688 0.02549374  
## X1233 0.004014905 249.07190 0.02120467  
## X1234 0.004030249 248.12365 0.02119819  
## X1235 0.002315861 431.80479 0.02377688  
## X1236 0.002041838 489.75488 0.02497434  
## X1237 0.003068540 325.88783 0.02181616  
## X1238 0.003027892 330.26281 0.02269046  
## X1239 0.002594270 385.46491 0.02290297  
## X1240 0.002488519 401.84545 0.02315920  
## X1241 0.002490489 401.52754 0.02305562  
## X1242 0.003473761 287.87239 0.02141984  
## X1243 0.002648083 377.63169 0.02269862  
## X1244 0.003031936 329.82228 0.02192797  
## X1245 0.001633488 612.18687 0.02800153  
## X1246 0.001653726 604.69515 0.02722794  
## X1247 0.002546812 392.64777 0.02295049  
## X1248 0.001444109 692.46861 0.02967062  
## X1249 0.001791353 558.23721 0.02486579  
## X1250 0.001682184 594.46525 0.02566710  
## X1251 0.001644163 608.21226 0.02691696  
## X1252 0.002175209 459.72590 0.02398148  
## X1253 0.002668111 374.79704 0.02223094  
## X1254 0.001491015 670.68385 0.02983031  
## X1255 0.001456382 686.63285 0.03135665  
## X1256 0.004021225 248.68043 0.02136773  
## X1257 0.002319637 431.10186 0.02352902  
## X1258 0.002077381 481.37533 0.02459526  
## X1259 0.002389629 418.47500 0.02339579  
## X1260 0.002310686 432.77189 0.02364078  
## X1261 0.002302811 434.25186 0.02391513  
## X1262 0.002234576 447.51223 0.02393275  
## X1263 0.002293278 436.05710 0.02398712  
## X1264 0.002158242 463.34010 0.02455527  
## X1265 0.002315127 431.94172 0.02325018  
## X1266 0.002389837 418.43867 0.02303567  
## X1267 0.002065451 484.15573 0.02385103  
## X1268 0.002104071 475.26921 0.02439568  
## X1269 0.003111031 321.43690 0.02285619  
## X1270 0.001875320 533.24239 0.02502449  
## X1271 0.002829724 353.39138 0.02284587  
## X1272 0.001668780 599.24014 0.02853266  
## X1273 0.003842419 260.25274 0.02177675  
## X1274 0.003600792 277.71666 0.02212752  
## X1275 0.001663014 601.31795 0.02642058  
## X1276 0.002684667 372.48573 0.02238203  
## X1277 0.002922785 342.13938 0.02206518  
## X1278 0.004061659 246.20478 0.02144770  
## X1279 0.002965891 337.16683 0.02207268  
## X1280 0.005082988 196.73466 0.02728269  
## X1281 0.002650297 377.31615 0.02266352  
## X1282 0.001904336 525.11734 0.02553196  
## X1283 0.002027509 493.21604 0.02461051  
## X1284 0.001903472 525.35590 0.02517895  
## X1285 0.002148309 465.48246 0.02472295  
## X1286 0.002679002 373.27333 0.02291487  
## X1287 0.002745029 364.29485 0.02225434  
## X1288 0.002644733 378.11003 0.02242469  
## X1289 0.003945591 253.44749 0.02133979  
## X1290 0.002347549 425.97622 0.02432313  
## X1291 0.001879537 532.04604 0.02585092  
## X1292 0.001658717 602.87569 0.02742838  
## X1293 0.004283125 233.47441 0.02127576  
## X1294 0.001775642 563.17644 0.02511043  
## X1295 0.001756120 569.43704 0.02661273  
## X1296 0.002296748 435.39824 0.02360956  
## X1297 0.002607867 383.45515 0.02395351  
## X1298 0.002827593 353.65773 0.02275064  
## X1299 0.002341621 427.05454 0.02404024  
## X1300 0.002432463 411.10602 0.02337719  
## X1301 0.002065975 484.03299 0.02474731  
## X1302 0.002748505 363.83417 0.02200445  
## X1303 0.002436762 410.38067 0.02275279  
## X1304 0.002392484 417.97564 0.02322588  
## X1305 0.002521822 396.53873 0.02286025  
## X1306 0.002473261 404.32450 0.02311297  
## X1307 0.001958926 510.48368 0.02496062  
## X1308 0.001431361 698.63581 0.03012414  
## X1309 0.001442363 693.30691 0.02905075  
## X1310 0.003281825 304.70855 0.02182480  
## X1311 0.003934758 254.14523 0.02134859  
##   
## $usekernel  
## [1] TRUE  
##   
## $varnames  
## [1] "BrestDensity" "CalcType" "CalcDistribution"   
## [4] "LesionVolume" "LesionArea" "SphericalDisproportion"  
## [7] "Sphericity" "SurfaceToVolumeRatio"   
##   
## $xNames  
## [1] "BrestDensity" "CalcType" "CalcDistribution"   
## [4] "LesionVolume" "LesionArea" "SphericalDisproportion"  
## [7] "Sphericity" "SurfaceToVolumeRatio"   
##   
## $problemType  
## [1] "Classification"  
##   
## $tuneValue  
## fL usekernel adjust  
## 2 0 TRUE 1  
##   
## $obsLevels  
## [1] "BENIGN" "MALIGNANT"  
## attr(,"ordered")  
## [1] FALSE  
##   
## $param  
## list()  
##   
## attr(,"class")  
## [1] "NaiveBayes"

## [1] 0.7019590 0.7454545 0.6680871 0.6492537 0.7012593 0.6385261 0.5979334  
## [8] 0.6480186 0.7030303 0.6156142 0.6854191 0.7126866 0.7724455 0.7248134  
## [15] 0.6642992 0.7072331 0.5932836 0.5878788 0.7097902 0.6676136 0.7621269  
## [22] 0.5941725 0.6907003 0.6819030 0.6944056 0.6797203 0.5835701 0.6467803  
## [29] 0.6805970 0.6916188 0.6259328 0.5792910 0.6511194 0.7150402 0.6142191  
## [36] 0.6368937 0.6669776 0.6786381 0.6282051 0.6855478 0.7329757 0.7410038  
## [43] 0.7483428 0.7113662 0.5972028 0.7040184 0.6699301 0.6618470 0.6410914  
## [50] 0.7198622 0.6865672 0.6201026 0.6666667 0.6771527 0.6903409 0.7322618  
## [57] 0.6391608 0.7104640 0.6875000 0.6396270 0.6803674 0.6877367 0.6809701  
## [64] 0.7440559 0.6060606 0.5678530 0.7221445 0.6436567 0.7069129 0.6291619  
## [71] 0.6590485 0.7378731 0.6468427 0.7375431 0.6969001 0.6264205 0.6791045  
## [78] 0.5671329 0.6659564 0.5729944 0.6541511 0.6233675 0.6717949 0.6907649  
## [85] 0.6734788 0.6902411 0.7244755 0.7303504 0.6129261 0.7244546 0.7143513  
## [92] 0.7572905 0.6751399 0.6129261 0.7922108 0.6004662 0.6385261 0.7340987  
## [99] 0.6331002 0.6785304

## Cross-Validated (10 fold, repeated 10 times) Confusion Matrix   
##   
## (entries are percentual average cell counts across resamples)  
##   
## Reference  
## Prediction BENIGN MALIGNANT  
## BENIGN 40.0 27.9  
## MALIGNANT 9.2 22.9  
##   
## Accuracy (average) : 0.6294



## [1] 0.4509009

## [1] 0.8136434

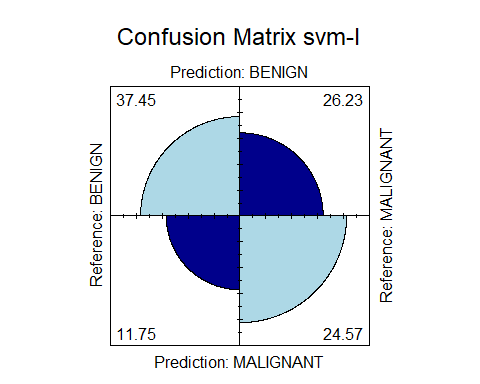
## [1] 0.6293669

Display info about svm-l model after 10-fold validation:

## Support Vector Machine object of class "ksvm"   
##   
## SV type: C-svc (classification)   
## parameter : cost C = 1   
##   
## Linear (vanilla) kernel function.   
##   
## Number of Support Vectors : 1110   
##   
## Objective Function Value : -1102.263   
## Training error : 0.393593   
## Probability model included.

## [1] 0.6777052 0.5772675 0.6762238 0.6623134 0.7177156 0.6190814 0.6243004  
## [8] 0.6389925 0.6272727 0.6335247 0.7271455 0.6833022 0.6833525 0.5480186  
## [15] 0.6155303 0.5797203 0.6349024 0.6808266 0.6744792 0.5641325 0.7235431  
## [22] 0.7989739 0.5970149 0.6230769 0.5686553 0.6140069 0.6119403 0.6483209  
## [29] 0.6228438 0.6268657 0.6529138 0.5771780 0.6169920 0.6012127 0.6084960  
## [36] 0.6387593 0.6676772 0.6734266 0.7137784 0.6698048 0.6636051 0.6219683  
## [43] 0.6466884 0.6102564 0.6679104 0.7206439 0.5981352 0.6466200 0.6086754  
## [50] 0.6330654 0.6119792 0.6891572 0.6060606 0.6560168 0.6433984 0.7070034  
## [57] 0.5846549 0.6463835 0.6895522 0.6429924 0.5899767 0.6389678 0.6769231  
## [64] 0.5740528 0.6222015 0.6215844 0.6751399 0.7774971 0.6338619 0.6053504  
## [71] 0.6578089 0.6344697 0.6532183 0.6146958 0.6608496 0.6140392 0.6787405  
## [78] 0.6392257 0.6072261 0.6454650 0.6545455 0.6311553 0.5533800 0.5946828  
## [85] 0.6159049 0.6777052 0.6264064 0.6946023 0.6514351 0.7283582 0.6406250  
## [92] 0.6212121 0.7063146 0.6339839 0.5336174 0.6613088 0.6424907 0.7168843  
## [99] 0.6611474 0.6200466

## Cross-Validated (10 fold, repeated 10 times) Confusion Matrix   
##   
## (entries are percentual average cell counts across resamples)  
##   
## Reference  
## Prediction BENIGN MALIGNANT  
## BENIGN 37.5 26.2  
## MALIGNANT 11.7 24.6  
##   
## Accuracy (average) : 0.6202



## [1] 0.4836336

## [1] 0.7612403

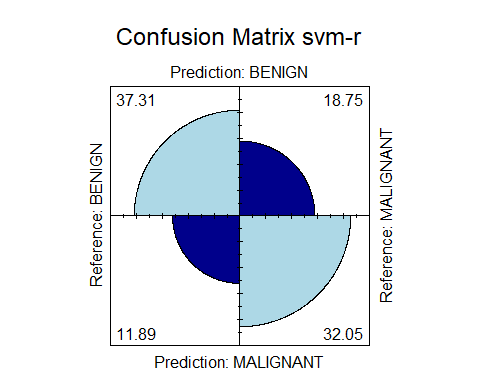
## [1] 0.6202136

Display info about svm-r model after 10-fold validation:

## Support Vector Machine object of class "ksvm"   
##   
## SV type: C-svc (classification)   
## parameter : cost C = 1   
##   
## Gaussian Radial Basis kernel function.   
## Hyperparameter : sigma = 0.258105254629504   
##   
## Number of Support Vectors : 965   
##   
## Objective Function Value : -840.5499   
## Training error : 0.26926   
## Probability model included.

## [1] 0.8388060 0.7258741 0.7194030 0.7845149 0.7400568 0.7560634 0.6888993  
## [8] 0.7095571 0.8004662 0.7028918 0.6799082 0.7840485 0.7424242 0.7740528  
## [15] 0.8102564 0.7250466 0.7507102 0.8080019 0.7148106 0.6471549 0.7489510  
## [22] 0.7236474 0.7566434 0.7874126 0.7628014 0.8498134 0.6875000 0.6884328  
## [29] 0.7765786 0.7230769 0.7355410 0.7762238 0.7118845 0.7981352 0.6735322  
## [36] 0.7393466 0.8309659 0.7448909 0.7414918 0.7673938 0.7154851 0.7714552  
## [43] 0.7526980 0.7488340 0.7621125 0.7458022 0.6615385 0.7552239 0.7210821  
## [50] 0.6991604 0.7122201 0.7398601 0.7310023 0.7977038 0.7259795 0.7308239  
## [57] 0.7258324 0.7855114 0.7113662 0.7111742 0.7543054 0.6966705 0.7505828  
## [64] 0.7526042 0.7779564 0.7793561 0.7882893 0.7817164 0.7377622 0.7791045  
## [71] 0.7104640 0.6808266 0.7824337 0.7252799 0.7266791 0.6899767 0.7428904  
## [78] 0.7442021 0.8002296 0.7400689 0.8104011 0.7244546 0.7638695 0.7216992  
## [85] 0.7478693 0.6747159 0.7460354 0.6941447 0.6976690 0.7213542 0.7590951  
## [92] 0.7028918 0.7944056 0.7866138 0.7017257 0.7111742 0.7623601 0.8456157  
## [99] 0.7891791 0.6634033

## Cross-Validated (10 fold, repeated 10 times) Confusion Matrix   
##   
## (entries are percentual average cell counts across resamples)  
##   
## Reference  
## Prediction BENIGN MALIGNANT  
## BENIGN 37.3 18.7  
## MALIGNANT 11.9 32.1  
##   
## Accuracy (average) : 0.6936



## [1] 0.6309309

## [1] 0.7582946

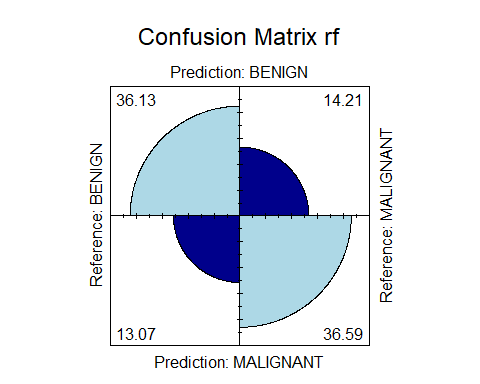
## [1] 0.6935927

Display info about rf model after 10-fold validation:

##   
## Call:  
## randomForest(x = x, y = y, mtry = param$mtry)   
## Type of random forest: classification  
## Number of trees: 500  
## No. of variables tried at each split: 8  
##   
## OOB estimate of error rate: 26.85%  
## Confusion matrix:  
## BENIGN MALIGNANT class.error  
## BENIGN 479 166 0.2573643  
## MALIGNANT 186 480 0.2792793

## [1] 0.8103330 0.8136364 0.8102181 0.8259095 0.8065814 0.8322062 0.7995569  
## [8] 0.7909091 0.7969697 0.7951259 0.7626866 0.7915112 0.8103730 0.8514351  
## [15] 0.8493007 0.8107509 0.8496686 0.8565341 0.7629162 0.7105877 0.8168998  
## [22] 0.7503498 0.7602564 0.8292541 0.7895522 0.8517957 0.7999067 0.8076026  
## [29] 0.8228473 0.8648680 0.8052705 0.8113054 0.8283617 0.8657343 0.7642045  
## [36] 0.8135653 0.8355824 0.7991963 0.8214452 0.8396096 0.8247435 0.7961754  
## [43] 0.8210103 0.8225280 0.8393800 0.7539646 0.8000000 0.8231917 0.7988573  
## [50] 0.7628265 0.7480177 0.7698135 0.7702797 0.8531573 0.8559935 0.8548769  
## [57] 0.7938002 0.8246922 0.7796785 0.7791193 0.8004592 0.8079219 0.8311189  
## [64] 0.7946259 0.8291619 0.8154593 0.8608496 0.8129664 0.7988345 0.8337543  
## [71] 0.7940341 0.7626866 0.8212595 0.8116838 0.7776353 0.6917249 0.7828671  
## [78] 0.8014925 0.8212400 0.7601607 0.8417677 0.8198622 0.8182984 0.8219288  
## [85] 0.7961648 0.7479877 0.7707556 0.7600459 0.7850816 0.8223248 0.8582090  
## [92] 0.7676073 0.8051282 0.8652052 0.7965252 0.7626657 0.8322062 0.8606576  
## [99] 0.8937733 0.7459207

## Cross-Validated (10 fold, repeated 10 times) Confusion Matrix   
##   
## (entries are percentual average cell counts across resamples)  
##   
## Reference  
## Prediction BENIGN MALIGNANT  
## BENIGN 36.1 14.2  
## MALIGNANT 13.1 36.6  
##   
## Accuracy (average) : 0.7272



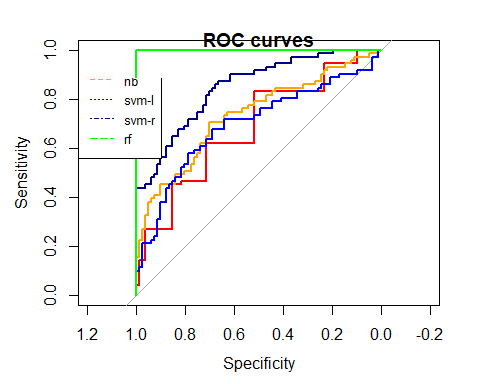
## [1] 0.7202703

## [1] 0.7344186

## [1] 0.7272311

|  |  |
| --- | --- |
| Specificity | 0.7202703 |
| Sensitivity | 0.7344186 |
| Accuracy | 0.7272311 |

Let us display ROC curves for the all created ML methods:

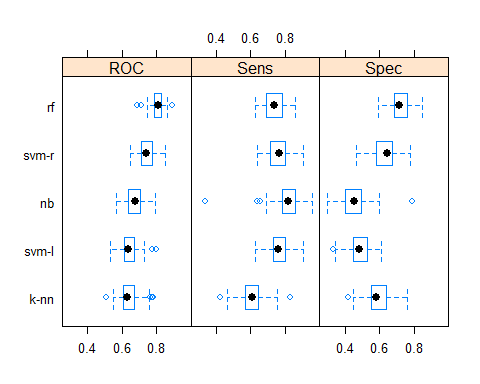
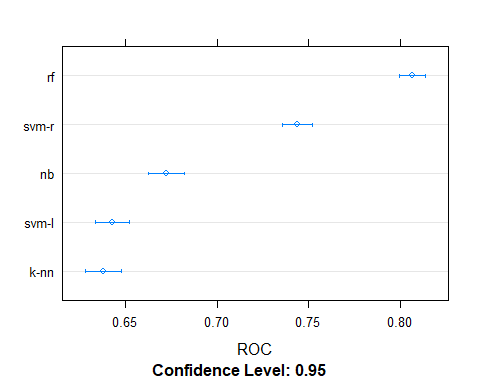


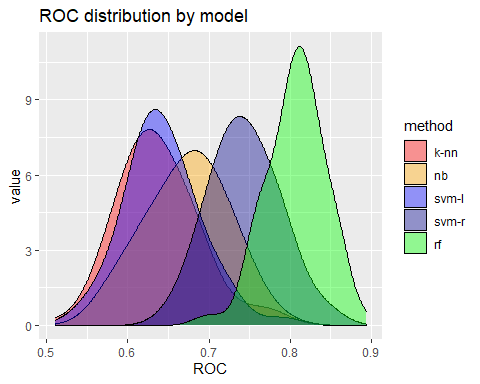
Compare ROC values of all models:

## Resample k-nn~ROC k-nn~Sens k-nn~Spec nb~ROC nb~Sens nb~Spec  
## 1 Fold01.Rep01 0.6778218 0.6875000 0.5522388 0.7012593 0.8593750 0.4179104  
## 2 Fold01.Rep02 0.7316931 0.6406250 0.6567164 0.7126866 0.8593750 0.4925373  
## 3 Fold01.Rep03 0.6275058 0.4769231 0.6666667 0.7097902 0.9076923 0.3636364  
## 4 Fold01.Rep04 0.6245921 0.6000000 0.6212121 0.6797203 0.7846154 0.5000000  
## 5 Fold01.Rep05 0.6117107 0.6153846 0.5671642 0.7040184 0.8307692 0.4626866  
## 6 Fold01.Rep06 0.6774384 0.6562500 0.6060606 0.6666667 0.8437500 0.3636364  
## 7 Fold01.Rep07 0.5979021 0.5076923 0.6212121 0.6396270 0.7692308 0.4090909  
## 8 Fold01.Rep08 0.6486014 0.6307692 0.6212121 0.7221445 0.8000000 0.4848485  
## 9 Fold01.Rep09 0.6837995 0.7230769 0.5606061 0.7244755 0.8769231 0.4848485  
## 10 Fold01.Rep10 0.6253551 0.6562500 0.5151515 0.6129261 0.8750000 0.3787879  
## 11 Fold02.Rep01 0.6161883 0.6153846 0.5671642 0.5979334 0.8000000 0.3731343  
## 12 Fold02.Rep02 0.6985774 0.5937500 0.6865672 0.7248134 0.8437500 0.4776119  
## 13 Fold02.Rep03 0.7817164 0.7031250 0.7611940 0.7621269 0.9375000 0.5522388  
## 14 Fold02.Rep04 0.6289062 0.6250000 0.5303030 0.6467803 0.7968750 0.4242424  
## 15 Fold02.Rep05 0.6793377 0.7187500 0.4925373 0.6618470 0.8750000 0.4029851  
## 16 Fold02.Rep06 0.5867661 0.6250000 0.5303030 0.6903409 0.8750000 0.4696970  
## 17 Fold02.Rep07 0.7676373 0.7187500 0.6969697 0.6877367 0.8125000 0.4848485  
## 18 Fold02.Rep08 0.5872396 0.4843750 0.5303030 0.7069129 0.8125000 0.4545455  
## 19 Fold02.Rep09 0.6239347 0.6093750 0.5454545 0.6264205 0.7968750 0.3636364  
## 20 Fold02.Rep10 0.5775058 0.6461538 0.4545455 0.6004662 0.8769231 0.3636364  
## 21 Fold03.Rep01 0.6178322 0.4769231 0.5909091 0.7030303 0.8461538 0.4848485  
## 22 Fold03.Rep02 0.6331803 0.6000000 0.6567164 0.7072331 0.8307692 0.4776119  
## 23 Fold03.Rep03 0.5979334 0.6615385 0.5522388 0.6907003 0.8307692 0.3880597  
## 24 Fold03.Rep04 0.6344432 0.5538462 0.5671642 0.6916188 0.9076923 0.3582090  
## 25 Fold03.Rep05 0.5903685 0.5781250 0.5522388 0.6669776 0.8437500 0.4029851  
## 26 Fold03.Rep06 0.6300699 0.5230769 0.5606061 0.6391608 0.7538462 0.4848485  
## 27 Fold03.Rep07 0.6779720 0.6769231 0.6363636 0.7440559 0.8153846 0.4848485  
## 28 Fold03.Rep08 0.6562500 0.5468750 0.6716418 0.6590485 0.8125000 0.4925373  
## 29 Fold03.Rep09 0.5686480 0.4615385 0.5454545 0.5671329 0.8153846 0.3787879  
## 30 Fold03.Rep10 0.6678530 0.5692308 0.6716418 0.7340987 0.8461538 0.5223881  
## 31 Fold04.Rep01 0.6326959 0.6250000 0.5820896 0.7019590 0.8750000 0.4776119  
## 32 Fold04.Rep02 0.6374126 0.6153846 0.5606061 0.5878788 0.7538462 0.4090909  
## 33 Fold04.Rep03 0.6118881 0.6153846 0.5757576 0.6944056 0.8000000 0.4545455  
## 34 Fold04.Rep04 0.5650653 0.5156250 0.6567164 0.5792910 0.6562500 0.4328358  
## 35 Fold04.Rep05 0.6066434 0.5230769 0.5606061 0.6282051 0.7692308 0.4545455  
## 36 Fold04.Rep06 0.6288479 0.6406250 0.5671642 0.6875000 0.8125000 0.4776119  
## 37 Fold04.Rep07 0.6087256 0.7230769 0.4179104 0.5678530 0.8615385 0.2985075  
## 38 Fold04.Rep08 0.6190586 0.5692308 0.5820896 0.6468427 0.8307692 0.3880597  
## 39 Fold04.Rep09 0.5722948 0.6093750 0.5671642 0.5729944 0.7812500 0.3283582  
## 40 Fold04.Rep10 0.6575201 0.6615385 0.5820896 0.6785304 0.8000000 0.4328358  
## 41 Fold05.Rep01 0.6955711 0.6307692 0.6515152 0.7454545 0.8153846 0.5303030  
## 42 Fold05.Rep02 0.6374290 0.5937500 0.6060606 0.6676136 0.6875000 0.5303030  
## 43 Fold05.Rep03 0.5105350 0.4218750 0.5757576 0.5835701 0.7500000 0.3787879  
## 44 Fold05.Rep04 0.6153846 0.6307692 0.5522388 0.7150402 0.8615385 0.4328358  
## 45 Fold05.Rep05 0.6473881 0.5312500 0.6417910 0.7329757 0.8125000 0.5522388  
## 46 Fold05.Rep06 0.6466131 0.4923077 0.6865672 0.6803674 0.7538462 0.5373134  
## 47 Fold05.Rep07 0.5670476 0.6250000 0.5074627 0.6436567 0.7812500 0.4776119  
## 48 Fold05.Rep08 0.6613088 0.6307692 0.5373134 0.6969001 0.8307692 0.4776119  
## 49 Fold05.Rep09 0.6444729 0.6250000 0.6119403 0.6233675 0.7656250 0.4179104  
## 50 Fold05.Rep10 0.6210938 0.5468750 0.6060606 0.6129261 0.7968750 0.3484848  
## 51 Fold06.Rep01 0.6712831 0.6562500 0.6212121 0.6680871 0.8125000 0.3484848  
## 52 Fold06.Rep02 0.5504662 0.5846154 0.5303030 0.5941725 0.8000000 0.3939394  
## 53 Fold06.Rep03 0.7324914 0.6769231 0.6119403 0.6805970 0.8153846 0.4925373  
## 54 Fold06.Rep04 0.6640625 0.7031250 0.5671642 0.6368937 0.8281250 0.3582090  
## 55 Fold06.Rep05 0.7026515 0.6406250 0.6515152 0.7483428 0.8437500 0.4696970  
## 56 Fold06.Rep06 0.6497130 0.6769231 0.5223881 0.7198622 0.9538462 0.2985075  
## 57 Fold06.Rep07 0.6529277 0.7230769 0.5522388 0.6291619 0.8000000 0.4477612  
## 58 Fold06.Rep08 0.6468050 0.8281250 0.4477612 0.6791045 0.9062500 0.4029851  
## 59 Fold06.Rep09 0.6691931 0.6250000 0.6567164 0.6907649 0.8281250 0.4925373  
## 60 Fold06.Rep10 0.6842710 0.6153846 0.6716418 0.7143513 0.8769231 0.4477612  
## 61 Fold07.Rep01 0.6724580 0.6093750 0.6268657 0.6492537 0.7656250 0.5223881  
## 62 Fold07.Rep02 0.6889782 0.5538462 0.7462687 0.6854191 0.8307692 0.4626866  
## 63 Fold07.Rep03 0.5852379 0.5312500 0.5223881 0.6259328 0.7187500 0.4626866  
## 64 Fold07.Rep04 0.6820196 0.7187500 0.5671642 0.6786381 0.8593750 0.4328358  
## 65 Fold07.Rep05 0.6244755 0.5230769 0.6060606 0.5972028 0.7692308 0.4393939  
## 66 Fold07.Rep06 0.6406250 0.5312500 0.6716418 0.6201026 0.7656250 0.4029851  
## 67 Fold07.Rep07 0.5865205 0.5156250 0.5671642 0.7378731 0.8593750 0.5970149  
## 68 Fold07.Rep08 0.6364820 0.5625000 0.6666667 0.6659564 0.7500000 0.4545455  
## 69 Fold07.Rep09 0.6167623 0.5846154 0.5522388 0.6902411 0.8769231 0.3582090  
## 70 Fold07.Rep10 0.6373601 0.6250000 0.6119403 0.6751399 0.7812500 0.4179104  
## 71 Fold08.Rep01 0.6105410 0.5625000 0.6119403 0.6385261 0.8125000 0.3731343  
## 72 Fold08.Rep02 0.7019518 0.6923077 0.6119403 0.7724455 0.9076923 0.5223881  
## 73 Fold08.Rep03 0.6041278 0.6875000 0.5373134 0.6511194 0.7968750 0.3880597  
## 74 Fold08.Rep04 0.6284382 0.6000000 0.5606061 0.6855478 0.8769231 0.3484848  
## 75 Fold08.Rep05 0.6552448 0.5230769 0.6969697 0.6699301 0.8153846 0.5303030  
## 76 Fold08.Rep06 0.6470723 0.6307692 0.5522388 0.6771527 0.8615385 0.4179104  
## 77 Fold08.Rep07 0.6967853 0.6307692 0.6417910 0.7375431 0.8615385 0.4626866  
## 78 Fold08.Rep08 0.6670942 0.5937500 0.6119403 0.6541511 0.7812500 0.4477612  
## 79 Fold08.Rep09 0.5891335 0.4843750 0.6363636 0.7303504 0.7968750 0.4242424  
## 80 Fold08.Rep10 0.7602612 0.6875000 0.7014925 0.7922108 0.9218750 0.5671642  
## 81 Fold09.Rep01 0.6729604 0.6615385 0.6363636 0.6480186 0.8000000 0.5151515  
## 82 Fold09.Rep02 0.5801373 0.5781250 0.5151515 0.6642992 0.8437500 0.4393939  
## 83 Fold09.Rep03 0.6020979 0.5692308 0.5303030 0.6142191 0.8307692 0.4242424  
## 84 Fold09.Rep04 0.7001657 0.6093750 0.6666667 0.7410038 0.8437500 0.5606061  
## 85 Fold09.Rep05 0.6359608 0.5625000 0.5671642 0.6410914 0.7656250 0.4776119  
## 86 Fold09.Rep06 0.6758898 0.6153846 0.6417910 0.7322618 0.8615385 0.4925373  
## 87 Fold09.Rep07 0.6255830 0.5312500 0.6567164 0.6809701 0.8437500 0.4925373  
## 88 Fold09.Rep08 0.6243590 0.5692308 0.6212121 0.6717949 0.8000000 0.5151515  
## 89 Fold09.Rep09 0.6022962 0.5692308 0.5970149 0.7244546 0.8153846 0.5074627  
## 90 Fold09.Rep10 0.6126399 0.5781250 0.6119403 0.6385261 0.6562500 0.5522388  
## 91 Fold10.Rep01 0.5873708 0.5846154 0.5671642 0.6156142 0.7538462 0.4776119  
## 92 Fold10.Rep02 0.5573694 0.5781250 0.4925373 0.5932836 0.6406250 0.4776119  
## 93 Fold10.Rep03 0.6142724 0.6250000 0.5820896 0.6819030 0.8593750 0.4776119  
## 94 Fold10.Rep04 0.6011481 0.6000000 0.5373134 0.7113662 0.8000000 0.4776119  
## 95 Fold10.Rep05 0.6703789 0.6769231 0.5820896 0.6865672 0.9538462 0.2985075  
## 96 Fold10.Rep06 0.5870028 0.6250000 0.5000000 0.7104640 0.7968750 0.4393939  
## 97 Fold10.Rep07 0.6102036 0.5937500 0.5757576 0.6060606 0.7187500 0.5000000  
## 98 Fold10.Rep08 0.6063146 0.5692308 0.6268657 0.6734788 0.3384615 0.7910448  
## 99 Fold10.Rep09 0.7779564 0.7538462 0.6716418 0.7572905 0.8923077 0.5522388  
## 100 Fold10.Rep10 0.5770396 0.5692308 0.5000000 0.6331002 0.7384615 0.3939394  
## svm-l~ROC svm-l~Sens svm-l~Spec svm-r~ROC svm-r~Sens svm-r~Spec rf~ROC  
## 1 0.6777052 0.7968750 0.4477612 0.7250466 0.7500000 0.5970149 0.8107509  
## 2 0.7271455 0.8437500 0.5074627 0.7560634 0.7968750 0.6417910 0.8322062  
## 3 0.7235431 0.7384615 0.5454545 0.7566434 0.7692308 0.6969697 0.7602564  
## 4 0.6529138 0.7384615 0.5151515 0.7310023 0.7384615 0.6515152 0.7702797  
## 5 0.6636051 0.7846154 0.5223881 0.7526980 0.8461538 0.5671642 0.8210103  
## 6 0.6119792 0.7656250 0.3939394 0.7118845 0.7656250 0.5757576 0.8283617  
## 7 0.5899767 0.7384615 0.4545455 0.7505828 0.8000000 0.6666667 0.8311189  
## 8 0.6578089 0.7230769 0.5454545 0.7944056 0.7230769 0.6666667 0.8051282  
## 9 0.6545455 0.8000000 0.5303030 0.7638695 0.7692308 0.6363636 0.8182984  
## 10 0.6406250 0.7968750 0.3787879 0.7824337 0.8125000 0.6515152 0.8212595  
## 11 0.5772675 0.7538462 0.4477612 0.7148106 0.6461538 0.6268657 0.7629162  
## 12 0.6833022 0.7812500 0.4925373 0.7845149 0.7812500 0.6417910 0.8259095  
## 13 0.7989739 0.9062500 0.6119403 0.8498134 0.8125000 0.7313433 0.8517957  
## 14 0.5771780 0.7343750 0.4696970 0.7308239 0.6875000 0.6666667 0.8548769  
## 15 0.6219683 0.8281250 0.4477612 0.7458022 0.9062500 0.4626866 0.7539646  
## 16 0.6891572 0.8125000 0.3939394 0.7393466 0.7968750 0.5454545 0.8135653  
## 17 0.6389678 0.7968750 0.4545455 0.7793561 0.7812500 0.6818182 0.8154593  
## 18 0.6344697 0.7031250 0.5000000 0.7111742 0.6406250 0.6666667 0.7626657  
## 19 0.6311553 0.7031250 0.4545455 0.6747159 0.7031250 0.6363636 0.7479877  
## 20 0.6212121 0.8461538 0.3636364 0.6899767 0.7384615 0.4696970 0.6917249  
## 21 0.6762238 0.8153846 0.4848485 0.8004662 0.7384615 0.7272727 0.7969697  
## 22 0.6833525 0.6769231 0.6119403 0.8388060 0.8153846 0.7313433 0.8103330  
## 23 0.5970149 0.7846154 0.4179104 0.7765786 0.7692308 0.7014925 0.8228473  
## 24 0.6169920 0.6615385 0.5074627 0.7113662 0.6615385 0.5671642 0.7796785  
## 25 0.6466884 0.7656250 0.5074627 0.7210821 0.7812500 0.6119403 0.7988573  
## 26 0.6060606 0.8153846 0.4545455 0.7414918 0.7076923 0.6666667 0.8214452  
## 27 0.6769231 0.7538462 0.5454545 0.7377622 0.7692308 0.6363636 0.7988345  
## 28 0.6532183 0.7656250 0.5522388 0.7891791 0.8125000 0.7164179 0.8937733  
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## 34 0.6012127 0.6250000 0.5223881 0.7236474 0.6406250 0.6716418 0.7503498  
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## 36 0.6560168 0.7500000 0.5223881 0.7714552 0.7656250 0.6567164 0.7961754  
## 37 0.5740528 0.8000000 0.3432836 0.6808266 0.8153846 0.5223881 0.7626866  
## 38 0.6146958 0.7384615 0.4029851 0.6966705 0.6769231 0.5970149 0.8079219  
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## 40 0.6339839 0.7384615 0.4626866 0.7244546 0.7230769 0.5671642 0.8198622  
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## 42 0.6155303 0.6406250 0.5606061 0.7400568 0.6875000 0.6515152 0.8065814  
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## 72 0.6808266 0.8153846 0.4626866 0.7740528 0.8153846 0.6417910 0.8514351  
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## 76 0.6463835 0.7538462 0.5373134 0.7977038 0.8153846 0.6716418 0.8531573  
## 77 0.7774971 0.8615385 0.4776119 0.7216992 0.7230769 0.5970149 0.8219288  
## 78 0.6392257 0.7343750 0.4776119 0.7252799 0.7812500 0.6119403 0.8116838  
## 79 0.6946023 0.7656250 0.5757576 0.7526042 0.8281250 0.6515152 0.7946259  
## 80 0.7168843 0.8437500 0.5970149 0.7866138 0.7031250 0.7611940 0.8652052  
## 81 0.6272727 0.7076923 0.5454545 0.7424242 0.7384615 0.6666667 0.8103730  
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## 85 0.6086754 0.7187500 0.4626866 0.6875000 0.6875000 0.5970149 0.7999067  
## 86 0.6895522 0.7846154 0.5223881 0.7258324 0.6923077 0.6716418 0.7938002  
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## 88 0.6072261 0.7384615 0.5454545 0.7428904 0.7384615 0.6515152 0.7828671  
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## 91 0.6335247 0.7230769 0.5223881 0.7194030 0.7384615 0.5820896 0.8102181  
## 92 0.5641325 0.7656250 0.3880597 0.6471549 0.7031250 0.5671642 0.7105877  
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## 94 0.6698048 0.7692308 0.4776119 0.7673938 0.8000000 0.6865672 0.8396096  
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## rf~Sens rf~Spec  
## 1 0.7656250 0.7164179  
## 2 0.7656250 0.7014925  
## 3 0.6461538 0.6969697  
## 4 0.7692308 0.6969697  
## 5 0.7230769 0.7313433  
## 6 0.7187500 0.7575758  
## 7 0.7538462 0.7878788  
## 8 0.7538462 0.7575758  
## 9 0.7692308 0.7575758  
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## 11 0.7538462 0.6567164  
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## 14 0.8593750 0.7424242  
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## 19 0.6875000 0.6666667  
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## 21 0.6769231 0.6818182  
## 22 0.6923077 0.7761194  
## 23 0.7846154 0.7014925  
## 24 0.6923077 0.7014925  
## 25 0.7812500 0.6716418  
## 26 0.7230769 0.7272727  
## 27 0.7538462 0.7121212  
## 28 0.8593750 0.7611940  
## 29 0.7846154 0.5909091  
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## 34 0.6875000 0.7014925  
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## 36 0.7656250 0.6865672  
## 37 0.7538462 0.6417910  
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## 42 0.7968750 0.6666667  
## 43 0.7500000 0.6818182  
## 44 0.6769231 0.7164179  
## 45 0.7343750 0.8059701  
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## 47 0.7031250 0.6865672  
## 48 0.6923077 0.7761194  
## 49 0.7500000 0.7014925  
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## 80 0.7187500 0.7910448  
## 81 0.7538462 0.7424242  
## 82 0.7812500 0.7878788  
## 83 0.8153846 0.6969697  
## 84 0.7187500 0.7575758  
## 85 0.7031250 0.6268657  
## 86 0.6923077 0.6865672  
## 87 0.6250000 0.6865672  
## 88 0.7846154 0.6666667  
## 89 0.7230769 0.8358209  
## 90 0.6562500 0.7462687  
## 91 0.7846154 0.6567164  
## 92 0.7343750 0.5970149  
## 93 0.7187500 0.6567164  
## 94 0.7538462 0.7611940  
## 95 0.7538462 0.8059701  
## 96 0.6562500 0.7424242  
## 97 0.7968750 0.7121212  
## 98 0.6615385 0.6865672  
## 99 0.7692308 0.7462687  
## 100 0.7230769 0.6060606

##   
## Call:  
## summary.resamples(object = res)  
##   
## Models: k-nn, nb, svm-l, svm-r, rf   
## Number of resamples: 100   
##   
## ROC   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## k-nn 0.5105350 0.6065612 0.6313829 0.6379236 0.6694895 0.7817164 0  
## nb 0.5671329 0.6385261 0.6785842 0.6725092 0.7078724 0.7922108 0  
## svm-l 0.5336174 0.6145316 0.6389802 0.6428316 0.6707103 0.7989739 0  
## svm-r 0.6471549 0.7141630 0.7426573 0.7439215 0.7763125 0.8498134 0  
## rf 0.6917249 0.7884346 0.8102755 0.8066898 0.8285618 0.8937733 0  
##   
## Sens   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## k-nn 0.4218750 0.5675481 0.6093750 0.6060649 0.6420072 0.8281250 0  
## nb 0.3384615 0.7837740 0.8153846 0.8135938 0.8593750 0.9538462 0  
## svm-l 0.6250000 0.7315505 0.7597356 0.7612115 0.8000000 0.9062500 0  
## svm-r 0.6406250 0.7192308 0.7656250 0.7582813 0.8000000 0.9062500 0  
## rf 0.6250000 0.6923077 0.7343750 0.7344567 0.7812500 0.8593750 0  
##   
## Spec   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## k-nn 0.4179104 0.5522388 0.5820896 0.5923112 0.6377205 0.7611940 0  
## nb 0.2985075 0.4029851 0.4545455 0.4508480 0.4925373 0.7910448 0  
## svm-l 0.3283582 0.4477612 0.4812302 0.4836228 0.5243668 0.6119403 0  
## svm-r 0.4626866 0.5820896 0.6417910 0.6309498 0.6716418 0.7761194 0  
## rf 0.5909091 0.6865672 0.7142696 0.7202510 0.7575758 0.8484848 0

Obtained results can be visualized:



Moreover, calculated ROC distributions should be visualized: 

### References

A. Karatzoglou, K. Hornik, A. Smola. 2019. *Package Kernlab*. <https://cran.r-project.org/web/packages/kernlab/kernlab.pdf>.

B. Ripley, W. Venables. 2020. *Package Class*. <https://cran.r-project.org/web/packages/class/class.pdf>.

C. Roever, K. Luebke, N. Raabe. 2020. *Package klaR*. <https://cran.r-project.org/web/packages/klaR/klaR.pdf>.

Kuhn, M. n.d. “Library Caret: Available Models.” <https://topepo.github.io/caret/available-models.html>.

L. Breiman, A. Liaw, A. Cutler. 2018. *Package randomRorest*. <https://cran.r-project.org/web/packages/randomForest/randomForest.pdf>.

M. Kuhn, S. Weston, J. Wing. 2020. *Package Caret*. <https://cran.r-project.org/web/packages/caret/caret.pdf>.

Murphy, K. P. 2012. *Machine Learning - a Probabilistic Perspective*. Adaptive Computation and Machine Learning Series. MIT Press.

R. Alizadehsani, M. Roshanzamir. 2019. “A Database for Using Machine Learning and Data Mining Techniques for Coronary Artery Disease Diagnosis.” *Scientific Data* 6 (227): 1–12. <https://doi.org/10.1002/andp.19053221004>.

R Core Team. 2019. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org>.

R Documentation team. n.d. “R Documentation: Knn.” <https://www.rdocumentation.org/packages/class/versions/7.3-17/topics/knn>.

———. n.d. “R Documentation: Ksvm.” <https://www.rdocumentation.org/packages/kernlab/versions/0.9-29/topics/ksvm>.

———. n.d. “R Documentation: NaiveBayes.” <https://www.rdocumentation.org/packages/klaR/versions/0.6-15/topics/NaiveBayes>.

———. n.d. “R Documentation: RandomForest.” <https://www.rdocumentation.org/packages/randomForest/versions/4.6-14/topics/randomForest>.

———. n.d. “R Documentation: Train.” <https://www.rdocumentation.org/packages/caret/versions/4.47/topics/train>.