

# Simulated examples for the survival ensemble methods

Select data type

Hnscc

Time point for event prediction:

4

Random seed for calibration and validation

43

K\_Outer loop CV (for validation)

5

K\_inner CV folds (model tuning)

3

Simulated data: random seed (generation):

4242

Sample size:

150

Observation time

5

Expected event prevalence by study end

0.5

Expected drop out rate

0.3

Custom data: path to data file

~/Desktop/Study\_KCL/PhD P

Predictors to use in the model

"baseline\_age\_", "genderdun"

Time variable name

time

Event indicator variable name

event

	AUCROC <small>⬆</small> <small>⬆</small>	BS <small>⬆</small> <small>⬆</small>	BS_scaled <small>⬆</small> <small>⬆</small>	C_score <small>⬆</small> <small>⬆</small>	Calib_slope <small>⬆</small> <small>⬆</small>	Calib_alpha <small>⬆</small> <small>⬆</small>	T <small>⬆</small> <small>⬆</small>
test	0.5374	0.2488	-1.3891	0.5352	0.0322	-0.0756	4
train	0.9812	0.0184	0.839	0.9683	1.8749	-0.0071	4

Showing 1 to 2 of 2 entries

Previous

1

Next

Internally cross-validated Test results for each CV fold:

Show

10

⬇ entries

Search:

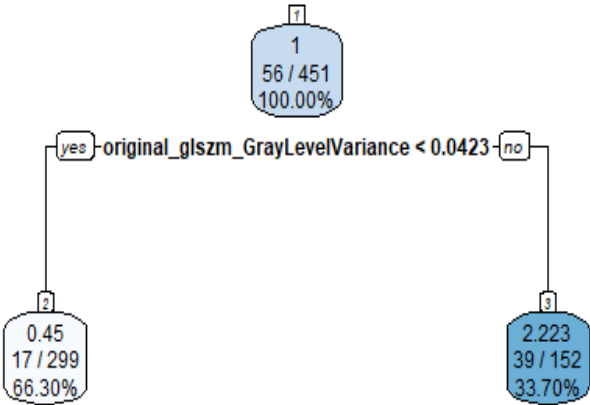
	AUCROC <small>⬆</small> <small>⬆</small>	BS <small>⬆</small> <small>⬆</small>	BS_scaled <small>⬆</small> <small>⬆</small>	C_score <small>⬆</small> <small>⬆</small>	Calib_slope <small>⬆</small> <small>⬆</small>	Calib_alpha <small>⬆</small> <small>⬆</small>	T <small>⬆</small> <small>⬆</small>
test.1	0.4169	0.2503	-2.0758	0.429	0.0051	-0.1157	4
test.2	0.518	0.2915	-0.9754	0.5035	0.0133	-0.0122	4
test.3	0.6749	0.1724	-1.0472	0.6743	0.1038	-0.1075	4
test.4	0.5794	0.2582	-0.8513	0.5899	0.0339	-0.0292	4
test.5	0.4975	0.2718	-1.9957	0.4791	0.005	-0.1133	4

Showing 1 to 5 of 5 entries

Previous

1

Next



**Error:** figure margins too large

Show

10

▼entries

Search:

	coef ▼	exp(coef) ▼	se(coef) ▼	z ▼	Pr(> z ) ▼
original_firstorder_10Percentile	6.9419	1034.7678	0.132	52.5804	0
original_firstorder_90Percentile	7.2555	1415.8192	0.0836	86.8324	0
original_firstorder_Energy	-6.5962	0.0014	0.1102	-59.8487	0
original_firstorder_Entropy	-35.5832	0	0.118	-301.4817	0
original_firstorder_InterquartileRange	8.6369	5636.0235	0.1336	64.6339	0
original_firstorder_Kurtosis	-0.3791	0.6845	0.1069	-3.5449	0.0004
original_firstorder_Maximum	0.3032	1.3542	0.1101	2.7545	0.0059
original_firstorder_Mean	-30.7044	0	0.1239	-247.8801	0
original_firstorder_MeanAbsoluteDeviation	11.8792	144232.2359	0.1221	97.3146	0
original_firstorder_Median	22.0333	3706281525.8151	0.1299	169.5688	0

Showing 1 to 10 of 108 entries

Previous

1

2345...11Next

```

$test
  T      AUCROC      BS BS_scaled  C_score Calib_slope
1 4 0.4168810 0.2502980 -2.0757824 0.4289941 0.005058503
2 4 0.5180197 0.2915280 -0.9754438 0.5035239 0.013321138
3 4 0.6749285 0.1723554 -1.0471738 0.6743323 0.103752424
4 4 0.5794448 0.2582236 -0.8513478 0.5899428 0.033861069
5 4 0.4974927 0.2718345 -1.9957167 0.4791386 0.004989890
  Calib_alpha test cv_n
1 -0.11573737    1    1
2 -0.01220098    1    2
3 -0.10751499    1    3
4 -0.02920297    1    4
5 -0.11328853    1    5

$train
  T      AUCROC      BS BS_scaled  C_score
1 4 0.9684613 0.0265866373 0.7728557 0.9588310
2 4 1.0000000 0.0003993369 0.9960070 0.9671727
3 4 0.9719722 0.0247077547 0.7889596 0.9645630
4 4 0.9912011 0.0106756874 0.8960904 0.9834677
5 4 0.9741496 0.0297559591 0.7412164 0.9673077
  Calib_slope Calib_alpha test cv_n
1 0.5414577 -0.005858360    0    1
2 6.6858116 0.001038150    0    2
3 0.6183487 -0.012075400    0    3
4 0.9155262 -0.009023887    0    4
5 0.6131217 -0.009620454    0    5

$testaverage
  T      AUCROC      BS BS_scaled
4.00000000 0.53735335 0.24884793 -1.38909290
  C_score Calib_slope Calib_alpha      test
0.53518634 0.03219660 -0.07558897 1.00000000

$trainaverage
  T      AUCROC      BS BS_scaled
4.00000000 0.98115685 0.01842508 0.83902583
  C_score Calib_slope Calib_alpha      test
0.96826840 1.87485320 -0.00710799 0.00000000

$model_list
$model_list[[1]]
$model_list[[1]]$treemodel
n= 361

node), split, n, deviance, yval
  * denotes terminal node

1) root 361 279.77400 1.000000
  2) original_firstorder_Maximum< 0.6930725 314 170.36840 0.612921 *
  3) original_firstorder_Maximum>=0.6930725 47 70.39936 3.866427 *

$model_list[[1]]$modcoxmodel
Call:
coxph(formula = as.formula(paste("Surv(df_train$time, df_train$event) ~",
  paste(predict.factors, collapse = "+"))), data = df_train,
  x = TRUE)

```

coef

original_firstorder_10Percentile	6.292e+01
original_firstorder_90Percentile	-2.219e+01
original_firstorder_Energy	-1.848e+01
original_firstorder_Entropy	-1.101e+02
original_firstorder_InterquartileRange	1.868e+01
original_firstorder_Kurtosis	7.499e+00
original_firstorder_Maximum	-1.181e+01
original_firstorder_Mean	-7.247e+01
original_firstorder_MeanAbsoluteDeviation	1.430e+02
original_firstorder_Median	5.698e+01
original_firstorder_Minimum	7.076e+00
original_firstorder_Range	0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	-2.093e+01
original_firstorder_RootMeanSquared	-8.776e+00
original_firstorder_Skewness	-2.484e+00
original_firstorder_TotalEnergy	0.000e+00
original_firstorder_Uniformity	-7.582e+01
original_firstorder_Variance	3.018e+03
original_glcmm_Autocorrelation	-2.010e+01
original_glcmm_ClusterProminence	7.946e+02
original_glcmm_ClusterShade	6.289e+01
original_glcmm_ClusterTendency	-4.637e+01
original_glcmm_Contrast	8.613e+02
original_glcmm_Correlation	-1.513e+01
original_glcmm_DifferenceAverage	8.077e+02
original_glcmm_DifferenceEntropy	8.329e+01
original_glcmm_DifferenceVariance	-2.323e+03
original_glcmm_Id	5.273e+03
original_glcmm_Idm	-4.560e+03
original_glcmm_Idmn	-3.637e+01
original_glcmm_Idn	4.161e+01
original_glcmm_Imc1	-1.315e+01
original_glcmm_Imc2	-1.109e+01
original_glcmm_InverseVariance	5.094e+02
original_glcmm_JointAverage	-8.250e+01
original_glcmm_JointEnergy	3.305e+01
original_glcmm_JointEntropy	-7.407e+01
original_glcmm_MCC	-1.720e+00
original_glcmm_MaximumProbability	1.628e+01
original_glcmm_SumAverage	0.000e+00
original_glcmm_SumEntropy	1.146e+01
original_glcmm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	2.118e+01
original_gldm_DependenceNonUniformity	5.159e+00
original_gldm_DependenceNonUniformityNormalized	2.432e+01
original_gldm_DependenceVariance	-2.361e+01
original_gldm_GrayLevelNonUniformity	-1.745e+01
original_gldm_GrayLevelVariance	-3.297e+03
original_gldm_HighGrayLevelEmphasis	-5.311e+02
original_gldm_LargeDependenceEmphasis	-1.621e+02
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.183e+02
original_gldm_LargeDependenceLowGrayLevelEmphasis	2.802e+02
original_gldm_LowGrayLevelEmphasis	4.764e+02
original_gldm_SmallDependenceEmphasis	-4.258e+01
original_gldm_SmallDependenceHighGrayLevelEmphasis	2.832e+00
original_gldm_SmallDependenceLowGrayLevelEmphasis	-2.198e+01
original_glrlm_GrayLevelNonUniformity	1.717e+01
original_glrlm_GrayLevelNonUniformityNormalized	1.298e+01
original_glrlm_GrayLevelVariance	1.137e+02

original_glrlm_HighGrayLevelRunEmphasis	2.363e+02
original_glrlm_LongRunEmphasis	-1.835e+01
original_glrlm_LongRunHighGrayLevelEmphasis	-1.374e+01
original_glrlm_LongRunLowGrayLevelEmphasis	-1.072e+01
original_glrlm_LowGrayLevelRunEmphasis	-1.835e+03
original_glrlm_RunEntropy	1.405e+02
original_glrlm_RunLengthNonUniformity	5.173e+01
original_glrlm_RunLengthNonUniformityNormalized	8.646e+01
original_glrlm_RunPercentage	-1.962e+02
original_glrlm_RunVariance	1.305e+01
original_glrlm_ShortRunEmphasis	-1.328e+02
original_glrlm_ShortRunHighGrayLevelEmphasis	3.520e+02
original_glrlm_ShortRunLowGrayLevelEmphasis	1.173e+03
original_glszm_GrayLevelNonUniformity	-5.514e+00
original_glszm_GrayLevelNonUniformityNormalized	6.482e+00
original_glszm_GrayLevelVariance	1.826e+01
original_glszm_HighGrayLevelZoneEmphasis	-6.037e+01
original_glszm_LargeAreaEmphasis	-3.916e+03
original_glszm_LargeAreaHighGrayLevelEmphasis	-2.948e+00
original_glszm_LargeAreaLowGrayLevelEmphasis	-1.154e+01
original_glszm_LowGrayLevelZoneEmphasis	1.572e+01
original_glszm_SizeZoneNonUniformity	1.091e+00
original_glszm_SizeZoneNonUniformityNormalized	-6.266e+01
original_glszm_SmallAreaEmphasis	5.532e+01
original_glszm_SmallAreaHighGrayLevelEmphasis	3.639e+01
original_glszm_SmallAreaLowGrayLevelEmphasis	-2.877e+00
original_glszm_ZoneEntropy	-1.396e+01
original_glszm_ZonePercentage	-3.357e+01
original_glszm_ZoneVariance	3.924e+03
original_ngtdm_Busyness	2.466e+00
original_ngtdm_Coarseness	4.477e-01
original_ngtdm_Complexity	1.468e+01
original_ngtdm_Contrast	-4.695e+01
original_ngtdm_Strength	-3.795e+00
original_shape_Elongation	1.353e+01
original_shape_Flatness	-1.472e+01
original_shape_LeastAxisLength	2.724e+01
original_shape_MajorAxisLength	1.335e+01
original_shape_Maximum2DDiameterColumn	-1.234e+01
original_shape_Maximum2DDiameterRow	-1.967e+00
original_shape_Maximum2DDiameterSlice	-1.183e+01
original_shape_Maximum3DDiameter	1.547e+01
original_shape_MeshVolume	6.940e+02
original_shape_MinorAxisLength	-1.459e+01
original_shape_Sphericity	-3.098e+00
original_shape_SurfaceArea	-2.504e+01
original_shape_SurfaceVolumeRatio	2.318e+02
original_shape_VoxelVolume	-7.327e+02
cluster_tree3.866427	6.469e+00
	exp(coef)
original_firstorder_10Percentile	2.108e+27
original_firstorder_90Percentile	2.305e-10
original_firstorder_Energy	9.406e-09
original_firstorder_Entropy	1.498e-48
original_firstorder_InterquartileRange	1.302e+08
original_firstorder_Kurtosis	1.807e+03
original_firstorder_Maximum	7.419e-06
original_firstorder_Mean	3.368e-32
original_firstorder_MeanAbsoluteDeviation	1.317e+62

original_firstorder_Median	5.583e+24
original_firstorder_Minimum	1.183e+03
original_firstorder_Range	1.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	8.097e-10
original_firstorder_RootMeanSquared	1.544e-04
original_firstorder_Skewness	8.338e-02
original_firstorder_TotalEnergy	1.000e+00
original_firstorder_Uniformity	1.180e-33
original_firstorder_Variance	Inf
original_glcmm_Autocorrelation	1.870e-09
original_glcmm_ClusterProminence	Inf
original_glcmm_ClusterShade	2.054e+27
original_glcmm_ClusterTendency	7.286e-21
original_glcmm_Contrast	Inf
original_glcmm_Correlation	2.680e-07
original_glcmm_DifferenceAverage	Inf
original_glcmm_DifferenceEntropy	1.482e+36
original_glcmm_DifferenceVariance	0.000e+00
original_glcmm_Id	Inf
original_glcmm_Idm	0.000e+00
original_glcmm_Idmn	1.594e-16
original_glcmm_Idn	1.183e+18
original_glcmm_Imc1	1.953e-06
original_glcmm_Imc2	1.520e-05
original_glcmm_InverseVariance	1.643e+221
original_glcmm_JointAverage	1.474e-36
original_glcmm_JointEnergy	2.248e+14
original_glcmm_JointEntropy	6.800e-33
original_glcmm_MCC	1.791e-01
original_glcmm_MaximumProbability	1.173e+07
original_glcmm_SumAverage	1.000e+00
original_glcmm_SumEntropy	9.497e+04
original_glcmm_SumSquares	1.000e+00
original_gldm_DependenceEntropy	1.586e+09
original_gldm_DependenceNonUniformity	1.739e+02
original_gldm_DependenceNonUniformityNormalized	3.652e+10
original_gldm_DependenceVariance	5.569e-11
original_gldm_GrayLevelNonUniformity	2.635e-08
original_gldm_GrayLevelVariance	0.000e+00
original_gldm_HighGrayLevelEmphasis	2.210e-231
original_gldm_LargeDependenceEmphasis	3.940e-71
original_gldm_LargeDependenceHighGrayLevelEmphasis	2.368e+51
original_gldm_LargeDependenceLowGrayLevelEmphasis	4.686e+121
original_gldm_LowGrayLevelEmphasis	7.686e+206
original_gldm_SmallDependenceEmphasis	3.232e-19
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.698e+01
original_gldm_SmallDependenceLowGrayLevelEmphasis	2.845e-10
original_glrlm_GrayLevelNonUniformity	2.863e+07
original_glrlm_GrayLevelNonUniformityNormalized	4.324e+05
original_glrlm_GrayLevelVariance	2.436e+49
original_glrlm_HighGrayLevelRunEmphasis	4.287e+102
original_glrlm_LongRunEmphasis	1.069e-08
original_glrlm_LongRunHighGrayLevelEmphasis	1.079e-06
original_glrlm_LongRunLowGrayLevelEmphasis	2.208e-05
original_glrlm_LowGrayLevelRunEmphasis	0.000e+00
original_glrlm_RunEntropy	1.043e+61
original_glrlm_RunLengthNonUniformity	2.929e+22
original_glrlm_RunLengthNonUniformityNormalized	3.553e+37
original_glrlm_RunPercentage	5.999e-86

original_glrlm_RunVariance	4.673e+05
original_glrlm_ShortRunEmphasis	2.092e-58
original_glrlm_ShortRunHighGrayLevelEmphasis	7.497e+152
original_glrlm_ShortRunLowGrayLevelEmphasis	Inf
original_glszm_GrayLevelNonUniformity	4.029e-03
original_glszm_GrayLevelNonUniformityNormalized	6.535e+02
original_glszm_GrayLevelVariance	8.546e+07
original_glszm_HighGrayLevelZoneEmphasis	6.054e-27
original_glszm_LargeAreaEmphasis	0.000e+00
original_glszm_LargeAreaHighGrayLevelEmphasis	5.246e-02
original_glszm_LargeAreaLowGrayLevelEmphasis	9.723e-06
original_glszm_LowGrayLevelZoneEmphasis	6.720e+06
original_glszm_SizeZoneNonUniformity	2.978e+00
original_glszm_SizeZoneNonUniformityNormalized	6.105e-28
original_glszm_SmallAreaEmphasis	1.055e+24
original_glszm_SmallAreaHighGrayLevelEmphasis	6.372e+15
original_glszm_SmallAreaLowGrayLevelEmphasis	5.628e-02
original_glszm_ZoneEntropy	8.696e-07
original_glszm_ZonePercentage	2.627e-15
original_glszm_ZoneVariance	Inf
original_ngtdm_Busyness	1.177e+01
original_ngtdm_Coarseness	1.565e+00
original_ngtdm_Complexity	2.369e+06
original_ngtdm_Contrast	4.061e-21
original_ngtdm_Strength	2.248e-02
original_shape_Elongation	7.506e+05
original_shape_Flatness	4.041e-07
original_shape_LeastAxisLength	6.740e+11
original_shape_MajorAxisLength	6.250e+05
original_shape_Maximum2DDiameterColumn	4.377e-06
original_shape_Maximum2DDiameterRow	1.399e-01
original_shape_Maximum2DDiameterSlice	7.257e-06
original_shape_Maximum3DDiameter	5.217e+06
original_shape_MeshVolume	2.598e+301
original_shape_MinorAxisLength	4.625e-07
original_shape_Sphericity	4.516e-02
original_shape_SurfaceArea	1.338e-11
original_shape_SurfaceVolumeRatio	4.731e+100
original_shape_VoxelVolume	6.082e-319
cluster_tree3.866427	6.447e+02
	se(coef)
original_firstorder_10Percentile	1.392e-01
original_firstorder_90Percentile	8.672e-02
original_firstorder_Energy	1.204e-01
original_firstorder_Entropy	1.285e-01
original_firstorder_InterquartileRange	1.414e-01
original_firstorder_Kurtosis	1.176e-01
original_firstorder_Maximum	1.186e-01
original_firstorder_Mean	1.378e-01
original_firstorder_MeanAbsoluteDeviation	1.281e-01
original_firstorder_Median	1.518e-01
original_firstorder_Minimum	1.773e-01
original_firstorder_Range	1.384e-01
original_firstorder_RobustMeanAbsoluteDeviation	1.456e-01
original_firstorder_RootMeanSquared	1.326e-01
original_firstorder_Skewness	1.036e-01
original_firstorder_TotalEnergy	1.204e-01
original_firstorder_Uniformity	1.319e-01
original_firstorder_Variance	2.211e-01



original_glcm_Autocorrelation	1.616e-01
original_glcm_ClusterProminence	2.042e+00
original_glcm_ClusterShade	3.632e-01
original_glcm_ClusterTendency	1.923e-01
original_glcm_Contrast	8.294e-01
original_glcm_Correlation	1.471e-01
original_glcm_DifferenceAverage	1.494e-01
original_glcm_DifferenceEntropy	1.374e-01
original_glcm_DifferenceVariance	1.101e+00
original_glcm_Id	1.267e-01
original_glcm_Idm	1.271e-01
original_glcm_Idmn	2.482e-01
original_glcm_Idn	1.975e-01
original_glcm_Imc1	1.320e-01
original_glcm_Imc2	1.540e-01
original_glcm_InverseVariance	1.179e-01
original_glcm_JointAverage	1.726e-01
original_glcm_JointEnergy	1.198e-01
original_glcm_JointEntropy	1.251e-01
original_glcm_MCC	1.630e-01
original_glcm_MaximumProbability	1.295e-01
original_glcm_SumAverage	1.726e-01
original_glcm_SumEntropy	1.277e-01
original_glcm_SumSquares	2.326e-01
original_gldm_DependenceEntropy	1.238e-01
original_gldm_DependenceNonUniformity	8.950e-02
original_gldm_DependenceNonUniformityNormalized	1.055e-01
original_gldm_DependenceVariance	1.406e-01
original_gldm_GrayLevelNonUniformity	9.494e-02
original_gldm_GrayLevelVariance	2.207e-01
original_gldm_HighGrayLevelEmphasis	1.617e-01
original_gldm_LargeDependenceEmphasis	1.494e-01
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.169e-01
original_gldm_LargeDependenceLowGrayLevelEmphasis	4.168e-01
original_gldm_LowGrayLevelEmphasis	1.689e-01
original_gldm_SmallDependenceEmphasis	1.442e-01
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.283e-01
original_gldm_SmallDependenceLowGrayLevelEmphasis	2.640e-01
original_glrlm_GrayLevelNonUniformity	9.398e-02
original_glrlm_GrayLevelNonUniformityNormalized	1.310e-01
original_glrlm_GrayLevelVariance	2.112e-01
original_glrlm_HighGrayLevelRunEmphasis	1.611e-01
original_glrlm_LongRunEmphasis	8.942e-02
original_glrlm_LongRunHighGrayLevelEmphasis	1.014e-01
original_glrlm_LongRunLowGrayLevelEmphasis	2.313e-01
original_glrlm_LowGrayLevelRunEmphasis	1.851e-01
original_glrlm_RunEntropy	1.391e-01
original_glrlm_RunLengthNonUniformity	1.031e-01
original_glrlm_RunLengthNonUniformityNormalized	1.435e-01
original_glrlm_RunPercentage	1.477e-01
original_glrlm_RunVariance	8.186e-02
original_glrlm_ShortRunEmphasis	1.468e-01
original_glrlm_ShortRunHighGrayLevelEmphasis	1.599e-01
original_glrlm_ShortRunLowGrayLevelEmphasis	1.686e-01
original_glszm_GrayLevelNonUniformity	1.086e-01
original_glszm_GrayLevelNonUniformityNormalized	1.803e-01
original_glszm_GrayLevelVariance	1.468e-01
original_glszm_HighGrayLevelZoneEmphasis	1.542e-01
original_glszm_LargeAreaEmphasis	9.696e-02

original_glszm_LargeAreaHighGrayLevelEmphasis	7.142e-02
original_glszm_LargeAreaLowGrayLevelEmphasis	4.231e-01
original_glszm_LowGrayLevelZoneEmphasis	3.756e-01
original_glszm_SizeZoneNonUniformity	1.133e-01
original_glszm_SizeZoneNonUniformityNormalized	1.631e-01
original_glszm_SmallAreaEmphasis	1.730e-01
original_glszm_SmallAreaHighGrayLevelEmphasis	1.468e-01
original_glszm_SmallAreaLowGrayLevelEmphasis	3.061e-01
original_glszm_ZoneEntropy	1.687e-01
original_glszm_ZonePercentage	1.447e-01
original_glszm_ZoneVariance	9.678e-02
original_ngtdm_Busyness	3.221e-01
original_ngtdm_Coarseness	3.605e-01
original_ngtdm_Complexity	1.890e-01
original_ngtdm_Contrast	5.662e-01
original_ngtdm_Strength	2.547e-01
original_shape_Elongation	1.473e-01
original_shape_Flatness	1.653e-01
original_shape_LeastAxisLength	1.267e-01
original_shape_MajorAxisLength	1.351e-01
original_shape_Maximum2DDiameterColumn	1.289e-01
original_shape_Maximum2DDiameterRow	1.406e-01
original_shape_Maximum2DDiameterSlice	1.286e-01
original_shape_Maximum3DDiameter	1.215e-01
original_shape_MeshVolume	9.715e-02
original_shape_MinorAxisLength	1.265e-01
original_shape_Sphericity	1.546e-01
original_shape_SurfaceArea	9.567e-02
original_shape_SurfaceVolumeRatio	1.410e-01
original_shape_VoxelVolume	9.735e-02
cluster_tree3.866427	3.242e-01
z	
original_firstorder_10Percentile	451.938
original_firstorder_90Percentile	-255.877
original_firstorder_Energy	-153.463
original_firstorder_Entropy	-857.149
original_firstorder_InterquartileRange	132.099
original_firstorder_Kurtosis	63.777
original_firstorder_Maximum	-99.612
original_firstorder_Mean	-526.059
original_firstorder_MeanAbsoluteDeviation	1116.991
original_firstorder_Median	375.388
original_firstorder_Minimum	39.912
original_firstorder_Range	0.000
original_firstorder_RobustMeanAbsoluteDeviation	-143.761
original_firstorder_RootMeanSquared	-66.187
original_firstorder_Skewness	-23.987
original_firstorder_TotalEnergy	0.000
original_firstorder_Uniformity	-574.896
original_firstorder_Variance	13649.960
original_glcmm_Autocorrelation	-124.343
original_glcmm_ClusterProminence	389.144
original_glcmm_ClusterShade	173.143
original_glcmm_ClusterTendency	-241.109
original_glcmm_Contrast	1038.443
original_glcmm_Correlation	-102.877
original_glcmm_DifferenceAverage	5405.660
original_glcmm_DifferenceEntropy	606.200
original_glcmm_DifferenceVariance	-2109.476

original_glcm_Id	41608.356
original_glcm_Idm	-35871.054
original_glcm_Idmn	-146.536
original_glcm_Idn	210.694
original_glcm_Imc1	-99.588
original_glcm_Imc2	-72.057
original_glcm_InverseVariance	4318.509
original_glcm_JointAverage	-477.967
original_glcm_JointEnergy	275.938
original_glcm_JointEntropy	-592.064
original_glcm_MCC	-10.550
original_glcm_MaximumProbability	125.722
original_glcm_SumAverage	0.000
original_glcm_SumEntropy	89.729
original_glcm_SumSquares	0.000
original_gldm_DependenceEntropy	171.134
original_gldm_DependenceNonUniformity	57.637
original_gldm_DependenceNonUniformityNormalized	230.524
original_gldm_DependenceVariance	-167.984
original_gldm_GrayLevelNonUniformity	-183.817
original_gldm_GrayLevelVariance	-14942.194
original_gldm_HighGrayLevelEmphasis	-3283.530
original_gldm_LargeDependenceEmphasis	-1084.836
original_gldm_LargeDependenceHighGrayLevelEmphasis	1011.988
original_gldm_LargeDependenceLowGrayLevelEmphasis	672.100
original_gldm_LowGrayLevelEmphasis	2819.921
original_gldm_SmallDependenceEmphasis	-295.268
original_gldm_SmallDependenceHighGrayLevelEmphasis	22.065
original_gldm_SmallDependenceLowGrayLevelEmphasis	-83.268
original_glrlm_GrayLevelNonUniformity	182.690
original_glrlm_GrayLevelNonUniformityNormalized	99.051
original_glrlm_GrayLevelVariance	538.443
original_glrlm_HighGrayLevelRunEmphasis	1467.037
original_glrlm_LongRunEmphasis	-205.248
original_glrlm_LongRunHighGrayLevelEmphasis	-135.552
original_glrlm_LongRunLowGrayLevelEmphasis	-46.357
original_glrlm_LowGrayLevelRunEmphasis	-9913.128
original_glrlm_RunEntropy	1010.216
original_glrlm_RunLengthNonUniformity	501.843
original_glrlm_RunLengthNonUniformityNormalized	602.355
original_glrlm_RunPercentage	-1328.443
original_glrlm_RunVariance	159.480
original_glrlm_ShortRunEmphasis	-904.710
original_glrlm_ShortRunHighGrayLevelEmphasis	2201.709
original_glrlm_ShortRunLowGrayLevelEmphasis	6957.950
original_glszm_GrayLevelNonUniformity	-50.769
original_glszm_GrayLevelNonUniformityNormalized	35.960
original_glszm_GrayLevelVariance	124.379
original_glszm_HighGrayLevelZoneEmphasis	-391.404
original_glszm_LargeAreaEmphasis	-40385.085
original_glszm_LargeAreaHighGrayLevelEmphasis	-41.276
original_glszm_LargeAreaLowGrayLevelEmphasis	-27.275
original_glszm_LowGrayLevelZoneEmphasis	41.850
original_glszm_SizeZoneNonUniformity	9.629
original_glszm_SizeZoneNonUniformityNormalized	-384.236
original_glszm_SmallAreaEmphasis	319.702
original_glszm_SmallAreaHighGrayLevelEmphasis	247.931
original_glszm_SmallAreaLowGrayLevelEmphasis	-9.399
original_glszm_ZoneEntropy	-82.729

original_glszm_ZonePercentage	-231.959
original_glszm_ZoneVariance	40546.131
original_ngtdm_Busyness	7.655
original_ngtdm_Coarseness	1.242
original_ngtdm_Complexity	77.678
original_ngtdm_Contrast	-82.929
original_ngtdm_Strength	-14.900
original_shape_Elongation	91.813
original_shape_Flatness	-89.064
original_shape_LeastAxisLength	214.896
original_shape_MajorAxisLength	98.776
original_shape_Maximum2DDiameterColumn	-95.706
original_shape_Maximum2DDiameterRow	-13.988
original_shape_Maximum2DDiameterSlice	-92.022
original_shape_Maximum3DDiameter	127.290
original_shape_MeshVolume	7143.683
original_shape_MinorAxisLength	-115.296
original_shape_Sphericity	-20.041
original_shape_SurfaceArea	-261.709
original_shape_SurfaceVolumeRatio	1643.995
original_shape_VoxelVolume	-7526.295
cluster_tree3.866427	19.950

p

original_firstorder_10Percentile	< 2e-16
original_firstorder_90Percentile	< 2e-16
original_firstorder_Energy	< 2e-16
original_firstorder_Entropy	< 2e-16
original_firstorder_InterquartileRange	< 2e-16
original_firstorder_Kurtosis	< 2e-16
original_firstorder_Maximum	< 2e-16
original_firstorder_Mean	< 2e-16
original_firstorder_MeanAbsoluteDeviation	< 2e-16
original_firstorder_Median	< 2e-16
original_firstorder_Minimum	< 2e-16
original_firstorder_Range	1.000
original_firstorder_RobustMeanAbsoluteDeviation	< 2e-16
original_firstorder_RootMeanSquared	< 2e-16
original_firstorder_Skewness	< 2e-16
original_firstorder_TotalEnergy	1.000
original_firstorder_Uniformity	< 2e-16
original_firstorder_Variance	< 2e-16
original_glcmm_Autocorrelation	< 2e-16
original_glcmm_ClusterProminence	< 2e-16
original_glcmm_ClusterShade	< 2e-16
original_glcmm_ClusterTendency	< 2e-16
original_glcmm_Contrast	< 2e-16
original_glcmm_Correlation	< 2e-16
original_glcmm_DifferenceAverage	< 2e-16
original_glcmm_DifferenceEntropy	< 2e-16
original_glcmm_DifferenceVariance	< 2e-16
original_glcmm_Id	< 2e-16
original_glcmm_Idm	< 2e-16
original_glcmm_Idmn	< 2e-16
original_glcmm_Idn	< 2e-16
original_glcmm_Imc1	< 2e-16
original_glcmm_Imc2	< 2e-16
original_glcmm_InverseVariance	< 2e-16
original_glcmm_JointAverage	< 2e-16
original_glcmm_JointEnergy	< 2e-16

original_glcm_JointEntropy	< 2e-16
original_glcm_MCC	< 2e-16
original_glcm_MaximumProbability	< 2e-16
original_glcm_SumAverage	1.000
original_glcm_SumEntropy	< 2e-16
original_glcm_SumSquares	1.000
original_gldm_DependenceEntropy	< 2e-16
original_gldm_DependenceNonUniformity	< 2e-16
original_gldm_DependenceNonUniformityNormalized	< 2e-16
original_gldm_DependenceVariance	< 2e-16
original_gldm_GrayLevelNonUniformity	< 2e-16
original_gldm_GrayLevelVariance	< 2e-16
original_gldm_HighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceEmphasis	< 2e-16
original_gldm_LargeDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceLowGrayLevelEmphasis	< 2e-16
original_gldm_LowGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceEmphasis	< 2e-16
original_gldm_SmallDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceLowGrayLevelEmphasis	< 2e-16
original_glrlm_GrayLevelNonUniformity	< 2e-16
original_glrlm_GrayLevelNonUniformityNormalized	< 2e-16
original_glrlm_GrayLevelVariance	< 2e-16
original_glrlm_HighGrayLevelRunEmphasis	< 2e-16
original_glrlm_LongRunEmphasis	< 2e-16
original_glrlm_LongRunHighGrayLevelEmphasis	< 2e-16
original_glrlm_LongRunLowGrayLevelEmphasis	< 2e-16
original_glrlm_LowGrayLevelRunEmphasis	< 2e-16
original_glrlm_RunEntropy	< 2e-16
original_glrlm_RunLengthNonUniformity	< 2e-16
original_glrlm_RunLengthNonUniformityNormalized	< 2e-16
original_glrlm_RunPercentage	< 2e-16
original_glrlm_RunVariance	< 2e-16
original_glrlm_ShortRunEmphasis	< 2e-16
original_glrlm_ShortRunHighGrayLevelEmphasis	< 2e-16
original_glrlm_ShortRunLowGrayLevelEmphasis	< 2e-16
original_glszm_GrayLevelNonUniformity	< 2e-16
original_glszm_GrayLevelNonUniformityNormalized	< 2e-16
original_glszm_GrayLevelVariance	< 2e-16
original_glszm_HighGrayLevelZoneEmphasis	< 2e-16
original_glszm_LargeAreaEmphasis	< 2e-16
original_glszm_LargeAreaHighGrayLevelEmphasis	< 2e-16
original_glszm_LargeAreaLowGrayLevelEmphasis	< 2e-16
original_glszm_LowGrayLevelZoneEmphasis	< 2e-16
original_glszm_SizeZoneNonUniformity	< 2e-16
original_glszm_SizeZoneNonUniformityNormalized	< 2e-16
original_glszm_SmallAreaEmphasis	< 2e-16
original_glszm_SmallAreaHighGrayLevelEmphasis	< 2e-16
original_glszm_SmallAreaLowGrayLevelEmphasis	< 2e-16
original_glszm_ZoneEntropy	< 2e-16
original_glszm_ZonePercentage	< 2e-16
original_glszm_ZoneVariance	< 2e-16
original_ngtdm_Busyness	1.93e-14
original_ngtdm_Coarseness	0.214
original_ngtdm_Complexity	< 2e-16
original_ngtdm_Contrast	< 2e-16
original_ngtdm_Strength	< 2e-16
original_shape_Elongation	< 2e-16
original_shape_Flatness	< 2e-16

```

original_shape_LeastAxisLength          < 2e-16
original_shape_MajorAxisLength          < 2e-16
original_shape_Maximum2DDiameterColumn  < 2e-16
original_shape_Maximum2DDiameterRow     < 2e-16
original_shape_Maximum2DDiameterSlice   < 2e-16
original_shape_Maximum3DDiameter        < 2e-16
original_shape_MeshVolume                < 2e-16
original_shape_MinorAxisLength          < 2e-16
original_shape_Sphericity                < 2e-16
original_shape_SurfaceArea              < 2e-16
original_shape_SurfaceVolumeRatio        < 2e-16
original_shape_VoxelVolume              < 2e-16
cluster_tree3.866427                    < 2e-16

```

```

Likelihood ratio test=263.5 on 108 df, p=5.265e-15
n= 361, number of events= 48

```

```

$model_list[[1]]$clusters
[1] 0.612921 3.866427

```

```

$model_list[[2]]
$model_list[[2]]$treemodel
n= 361

```

```

node), split, n, deviance, yval
      * denotes terminal node

```

```

1) root 361 247.5581 1.0000000
  2) original_ngtdm_Complexity< -0.0829807 230 79.8152 0.4333402 *
  3) original_ngtdm_Complexity>=-0.0829807 131 142.1385 2.0967100 *

```

```

$model_list[[2]]$modcoxmodel

```

```

Call:

```

```

coxph(formula = as.formula(paste("Surv(df_train$time, df_train$event) ~",
  paste(predict.factors, collapse = "+"))), data = df_train,
  x = TRUE)

```

```

                                coef
original_firstorder_10Percentile -1.632e+03
original_firstorder_90Percentile  1.044e+03
original_firstorder_Energy        -5.873e+02
original_firstorder_Entropy        -6.152e+03
original_firstorder_InterquartileRange 2.274e+03
original_firstorder_Kurtosis       -1.906e+01
original_firstorder_Maximum        -1.782e+02
original_firstorder_Mean           -8.801e+02
original_firstorder_MeanAbsoluteDeviation 2.131e+03
original_firstorder_Median         5.065e+02
original_firstorder_Minimum        1.092e+03
original_firstorder_Range          0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation -4.699e+03
original_firstorder_RootMeanSquared -1.441e+01
original_firstorder_Skewness       1.828e+01
original_firstorder_TotalEnergy     0.000e+00
original_firstorder_Uniformity     -2.208e+03
original_firstorder_Variance       3.730e+04
original_glcm_Autocorrelation      -8.159e+03
original_glcm_ClusterProminence    5.074e+03

```

original_glcm_ClusterShade	6.039e+01
original_glcm_ClusterTendency	-2.204e+03
original_glcm_Contrast	1.431e+04
original_glcm_Correlation	-2.152e+02
original_glcm_DifferenceAverage	-1.171e+03
original_glcm_DifferenceEntropy	1.662e+03
original_glcm_DifferenceVariance	-1.546e+04
original_glcm_Id	1.529e+04
original_glcm_Idm	-1.622e+04
original_glcm_Idmn	-3.744e+02
original_glcm_Idn	5.888e+02
original_glcm_Imc1	-5.338e+02
original_glcm_Imc2	-9.110e+02
original_glcm_InverseVariance	1.162e+03
original_glcm_JointAverage	5.335e+02
original_glcm_JointEnergy	1.281e+03
original_glcm_JointEntropy	-2.383e+03
original_glcm_MCC	1.807e+02
original_glcm_MaximumProbability	1.663e+02
original_glcm_SumAverage	0.000e+00
original_glcm_SumEntropy	3.795e+03
original_glcm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	1.260e+03
original_gldm_DependenceNonUniformity	4.588e+02
original_gldm_DependenceNonUniformityNormalized	-3.308e+00
original_gldm_DependenceVariance	6.244e+02
original_gldm_GrayLevelNonUniformity	-6.959e+02
original_gldm_GrayLevelVariance	-4.388e+04
original_gldm_HighGrayLevelEmphasis	-1.698e+03
original_gldm_LargeDependenceEmphasis	-3.276e+03
original_gldm_LargeDependenceHighGrayLevelEmphasis	-8.393e+02
original_gldm_LargeDependenceLowGrayLevelEmphasis	-1.786e+03
original_gldm_LowGrayLevelEmphasis	1.110e+03
original_gldm_SmallDependenceEmphasis	-8.413e+02
original_gldm_SmallDependenceHighGrayLevelEmphasis	6.962e+02
original_gldm_SmallDependenceLowGrayLevelEmphasis	6.897e+01
original_glrlm_GrayLevelNonUniformity	-4.465e+01
original_glrlm_GrayLevelNonUniformityNormalized	-7.382e+02
original_glrlm_GrayLevelVariance	4.939e+03
original_glrlm_HighGrayLevelRunEmphasis	1.454e+04
original_glrlm_LongRunEmphasis	-1.800e+03
original_glrlm_LongRunHighGrayLevelEmphasis	-2.908e+02
original_glrlm_LongRunLowGrayLevelEmphasis	-3.290e+02
original_glrlm_LowGrayLevelRunEmphasis	7.593e+03
original_glrlm_RunEntropy	3.469e+02
original_glrlm_RunLengthNonUniformity	2.785e+02
original_glrlm_RunLengthNonUniformityNormalized	8.887e+03
original_glrlm_RunPercentage	-4.664e+03
original_glrlm_RunVariance	1.989e+03
original_glrlm_ShortRunEmphasis	-6.198e+03
original_glrlm_ShortRunHighGrayLevelEmphasis	-3.897e+03
original_glrlm_ShortRunLowGrayLevelEmphasis	-7.240e+03
original_glszm_GrayLevelNonUniformity	-1.479e+02
original_glszm_GrayLevelNonUniformityNormalized	6.729e+02
original_glszm_GrayLevelVariance	2.648e+02
original_glszm_HighGrayLevelZoneEmphasis	5.260e+01
original_glszm_LargeAreaEmphasis	-3.688e+04
original_glszm_LargeAreaHighGrayLevelEmphasis	1.838e+02
original_glszm_LargeAreaLowGrayLevelEmphasis	4.052e+01

original_glszm_LowGrayLevelZoneEmphasis	-1.444e+02
original_glszm_SizeZoneNonUniformity	6.286e+02
original_glszm_SizeZoneNonUniformityNormalized	1.080e+02
original_glszm_SmallAreaEmphasis	1.946e+02
original_glszm_SmallAreaHighGrayLevelEmphasis	-3.496e+02
original_glszm_SmallAreaLowGrayLevelEmphasis	4.584e+01
original_glszm_ZoneEntropy	5.382e+02
original_glszm_ZonePercentage	6.397e+02
original_glszm_ZoneVariance	3.713e+04
original_ngtdm_Busyness	3.824e+01
original_ngtdm_Coarseness	1.886e+02
original_ngtdm_Complexity	-2.526e+02
original_ngtdm_Contrast	-7.587e+02
original_ngtdm_Strength	-8.672e+01
original_shape_Elongation	1.130e+02
original_shape_Flatness	-1.818e+02
original_shape_LeastAxisLength	2.819e+02
original_shape_MajorAxisLength	7.008e+01
original_shape_Maximum2DDiameterColumn	-1.677e+02
original_shape_Maximum2DDiameterRow	2.072e+01
original_shape_Maximum2DDiameterSlice	-1.431e+01
original_shape_Maximum3DDiameter	1.453e+02
original_shape_MeshVolume	3.771e+03
original_shape_MinorAxisLength	3.534e+01
original_shape_Sphericity	-2.302e+02
original_shape_SurfaceArea	-2.886e+02
original_shape_SurfaceVolumeRatio	3.264e+02
original_shape_VoxelVolume	-4.314e+03
cluster_tree2.09671	2.482e+02
	exp(coef)
original_firstorder_10Percentile	0.000e+00
original_firstorder_90Percentile	Inf
original_firstorder_Energy	8.900e-256
original_firstorder_Entropy	0.000e+00
original_firstorder_InterquartileRange	Inf
original_firstorder_Kurtosis	5.263e-09
original_firstorder_Maximum	4.064e-78
original_firstorder_Mean	0.000e+00
original_firstorder_MeanAbsoluteDeviation	Inf
original_firstorder_Median	9.420e+219
original_firstorder_Minimum	Inf
original_firstorder_Range	1.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	0.000e+00
original_firstorder_RootMeanSquared	5.514e-07
original_firstorder_Skewness	8.706e+07
original_firstorder_TotalEnergy	1.000e+00
original_firstorder_Uniformity	0.000e+00
original_firstorder_Variance	Inf
original_glcmm_Autocorrelation	0.000e+00
original_glcmm_ClusterProminence	Inf
original_glcmm_ClusterShade	1.681e+26
original_glcmm_ClusterTendency	0.000e+00
original_glcmm_Contrast	Inf
original_glcmm_Correlation	3.635e-94
original_glcmm_DifferenceAverage	0.000e+00
original_glcmm_DifferenceEntropy	Inf
original_glcmm_DifferenceVariance	0.000e+00
original_glcmm_Id	Inf
original_glcmm_Idm	0.000e+00



original_glcmm_Idmn	2.606e-163
original_glcmm_Idn	5.423e+255
original_glcmm_Imc1	1.426e-232
original_glcmm_Imc2	0.000e+00
original_glcmm_InverseVariance	Inf
original_glcmm_JointAverage	5.212e+231
original_glcmm_JointEnergy	Inf
original_glcmm_JointEntropy	0.000e+00
original_glcmm_MCC	2.974e+78
original_glcmm_MaximumProbability	1.650e+72
original_glcmm_SumAverage	1.000e+00
original_glcmm_SumEntropy	Inf
original_glcmm_SumSquares	1.000e+00
original_gldm_DependenceEntropy	Inf
original_gldm_DependenceNonUniformity	1.724e+199
original_gldm_DependenceNonUniformityNormalized	3.659e-02
original_gldm_DependenceVariance	1.422e+271
original_gldm_GrayLevelNonUniformity	6.130e-303
original_gldm_GrayLevelVariance	0.000e+00
original_gldm_HighGrayLevelEmphasis	0.000e+00
original_gldm_LargeDependenceEmphasis	0.000e+00
original_gldm_LargeDependenceHighGrayLevelEmphasis	0.000e+00
original_gldm_LargeDependenceLowGrayLevelEmphasis	0.000e+00
original_gldm_LowGrayLevelEmphasis	Inf
original_gldm_SmallDependenceEmphasis	0.000e+00
original_gldm_SmallDependenceHighGrayLevelEmphasis	2.205e+302
original_gldm_SmallDependenceLowGrayLevelEmphasis	8.952e+29
original_glrmm_GrayLevelNonUniformity	4.066e-20
original_glrmm_GrayLevelNonUniformityNormalized	2.648e-321
original_glrmm_GrayLevelVariance	Inf
original_glrmm_HighGrayLevelRunEmphasis	Inf
original_glrmm_LongRunEmphasis	0.000e+00
original_glrmm_LongRunHighGrayLevelEmphasis	5.279e-127
original_glrmm_LongRunLowGrayLevelEmphasis	1.347e-143
original_glrmm_LowGrayLevelRunEmphasis	Inf
original_glrmm_RunEntropy	4.594e+150
original_glrmm_RunLengthNonUniformity	9.180e+120
original_glrmm_RunLengthNonUniformityNormalized	Inf
original_glrmm_RunPercentage	0.000e+00
original_glrmm_RunVariance	Inf
original_glrmm_ShortRunEmphasis	0.000e+00
original_glrmm_ShortRunHighGrayLevelEmphasis	0.000e+00
original_glrmm_ShortRunLowGrayLevelEmphasis	0.000e+00
original_glszm_GrayLevelNonUniformity	5.647e-65
original_glszm_GrayLevelNonUniformityNormalized	1.767e+292
original_glszm_GrayLevelVariance	1.002e+115
original_glszm_HighGrayLevelZoneEmphasis	6.953e+22
original_glszm_LargeAreaEmphasis	0.000e+00
original_glszm_LargeAreaHighGrayLevelEmphasis	6.949e+79
original_glszm_LargeAreaLowGrayLevelEmphasis	3.963e+17
original_glszm_LowGrayLevelZoneEmphasis	2.027e-63
original_glszm_SizeZoneNonUniformity	9.772e+272
original_glszm_SizeZoneNonUniformityNormalized	7.672e+46
original_glszm_SmallAreaEmphasis	3.198e+84
original_glszm_SmallAreaHighGrayLevelEmphasis	1.527e-152
original_glszm_SmallAreaLowGrayLevelEmphasis	8.064e+19
original_glszm_ZoneEntropy	5.258e+233
original_glszm_ZonePercentage	6.559e+277
original_glszm_ZoneVariance	Inf

original_ngtdm_Busyness	4.062e+16
original_ngtdm_Coarseness	7.918e+81
original_ngtdm_Complexity	1.900e-110
original_ngtdm_Contrast	0.000e+00
original_ngtdm_Strength	2.179e-38
original_shape_Elongation	1.173e+49
original_shape_Flatness	1.110e-79
original_shape_LeastAxisLength	2.554e+122
original_shape_MajorAxisLength	2.736e+30
original_shape_Maximum2DDiameterColumn	1.525e-73
original_shape_Maximum2DDiameterRow	9.970e+08
original_shape_Maximum2DDiameterSlice	6.069e-07
original_shape_Maximum3DDiameter	1.264e+63
original_shape_MeshVolume	Inf
original_shape_MinorAxisLength	2.238e+15
original_shape_Sphericity	1.083e-100
original_shape_SurfaceArea	4.522e-126
original_shape_SurfaceVolumeRatio	5.783e+141
original_shape_VoxelVolume	0.000e+00
cluster_tree2.09671	6.199e+107
	se(coef)
original_firstorder_10Percentile	9.288e-01
original_firstorder_90Percentile	1.421e+00
original_firstorder_Energy	6.423e-01
original_firstorder_Entropy	1.168e+00
original_firstorder_InterquartileRange	3.635e+00
original_firstorder_Kurtosis	6.438e-01
original_firstorder_Maximum	8.839e-01
original_firstorder_Mean	1.129e+00
original_firstorder_MeanAbsoluteDeviation	1.097e+00
original_firstorder_Median	1.098e+00
original_firstorder_Minimum	9.566e-01
original_firstorder_Range	8.934e-01
original_firstorder_RobustMeanAbsoluteDeviation	2.711e+00
original_firstorder_RootMeanSquared	1.029e+00
original_firstorder_Skewness	8.751e-01
original_firstorder_TotalEnergy	6.423e-01
original_firstorder_Uniformity	1.242e+00
original_firstorder_Variance	1.672e+00
original_glcmm_Autocorrelation	8.709e-01
original_glcmm_ClusterProminence	1.326e+01
original_glcmm_ClusterShade	2.390e+00
original_glcmm_ClusterTendency	1.396e+00
original_glcmm_Contrast	1.112e+01
original_glcmm_Correlation	1.187e+00
original_glcmm_DifferenceAverage	1.674e+00
original_glcmm_DifferenceEntropy	1.131e+00
original_glcmm_DifferenceVariance	1.227e+01
original_glcmm_Id	1.193e+00
original_glcmm_Idm	1.163e+00
original_glcmm_Idmn	1.446e+00
original_glcmm_Idn	1.107e+00
original_glcmm_Imc1	1.148e+00
original_glcmm_Imc2	1.182e+00
original_glcmm_InverseVariance	1.768e+00
original_glcmm_JointAverage	9.753e-01
original_glcmm_JointEnergy	1.414e+00
original_glcmm_JointEntropy	1.186e+00
original_glcmm_MCC	1.191e+00

original_glcm_MaximumProbability	1.543e+00
original_glcm_SumAverage	9.753e-01
original_glcm_SumEntropy	1.203e+00
original_glcm_SumSquares	1.717e+00
original_gldm_DependenceEntropy	1.320e+00
original_gldm_DependenceNonUniformity	5.184e-01
original_gldm_DependenceNonUniformityNormalized	1.600e+00
original_gldm_DependenceVariance	1.372e+00
original_gldm_GrayLevelNonUniformity	3.690e-01
original_gldm_GrayLevelVariance	1.668e+00
original_gldm_HighGrayLevelEmphasis	8.663e-01
original_gldm_LargeDependenceEmphasis	1.086e+00
original_gldm_LargeDependenceHighGrayLevelEmphasis	6.186e-01
original_gldm_LargeDependenceLowGrayLevelEmphasis	3.499e+00
original_gldm_LowGrayLevelEmphasis	8.695e-01
original_gldm_SmallDependenceEmphasis	1.141e+00
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.563e+00
original_gldm_SmallDependenceLowGrayLevelEmphasis	1.019e+00
original_glrlm_GrayLevelNonUniformity	3.887e-01
original_glrlm_GrayLevelNonUniformityNormalized	1.114e+00
original_glrlm_GrayLevelVariance	1.593e+00
original_glrlm_HighGrayLevelRunEmphasis	8.566e-01
original_glrlm_LongRunEmphasis	1.250e+00
original_glrlm_LongRunHighGrayLevelEmphasis	7.039e-01
original_glrlm_LongRunLowGrayLevelEmphasis	1.632e+00
original_glrlm_LowGrayLevelRunEmphasis	9.104e-01
original_glrlm_RunEntropy	1.178e+00
original_glrlm_RunLengthNonUniformity	5.549e-01
original_glrlm_RunLengthNonUniformityNormalized	1.136e+00
original_glrlm_RunPercentage	1.062e+00
original_glrlm_RunVariance	1.351e+00
original_glrlm_ShortRunEmphasis	9.995e-01
original_glrlm_ShortRunHighGrayLevelEmphasis	1.040e+00
original_glrlm_ShortRunLowGrayLevelEmphasis	8.189e-01
original_glszm_GrayLevelNonUniformity	6.988e-01
original_glszm_GrayLevelNonUniformityNormalized	1.171e+00
original_glszm_GrayLevelVariance	1.229e+00
original_glszm_HighGrayLevelZoneEmphasis	8.323e-01
original_glszm_LargeAreaEmphasis	3.577e-01
original_glszm_LargeAreaHighGrayLevelEmphasis	2.389e-01
original_glszm_LargeAreaLowGrayLevelEmphasis	3.345e+00
original_glszm_LowGrayLevelZoneEmphasis	1.176e+00
original_glszm_SizeZoneNonUniformity	7.232e-01
original_glszm_SizeZoneNonUniformityNormalized	1.392e+00
original_glszm_SmallAreaEmphasis	1.376e+00
original_glszm_SmallAreaHighGrayLevelEmphasis	8.483e-01
original_glszm_SmallAreaLowGrayLevelEmphasis	1.339e+00
original_glszm_ZoneEntropy	1.106e+00
original_glszm_ZonePercentage	1.187e+00
original_glszm_ZoneVariance	3.572e-01
original_ngtdm_Busyness	2.092e+00
original_ngtdm_Coarseness	8.675e-01
original_ngtdm_Complexity	2.935e+00
original_ngtdm_Contrast	5.999e+00
original_ngtdm_Strength	1.976e+00
original_shape_Elongation	1.186e+00
original_shape_Flatness	1.176e+00
original_shape_LeastAxisLength	5.658e-01
original_shape_MajorAxisLength	7.442e-01

original_shape_Maximum2DDiameterColumn	8.106e-01
original_shape_Maximum2DDiameterRow	7.065e-01
original_shape_Maximum2DDiameterSlice	7.038e-01
original_shape_Maximum3DDiameter	7.183e-01
original_shape_MeshVolume	3.129e-01
original_shape_MinorAxisLength	7.172e-01
original_shape_Sphericity	1.309e+00
original_shape_SurfaceArea	9.175e-01
original_shape_SurfaceVolumeRatio	1.262e+00
original_shape_VoxelVolume	3.138e-01
cluster_tree2.09671	2.917e+00
z	
original_firstorder_10Percentile	-1.757e+03
original_firstorder_90Percentile	7.351e+02
original_firstorder_Energy	-9.144e+02
original_firstorder_Entropy	-5.266e+03
original_firstorder_InterquartileRange	6.255e+02
original_firstorder_Kurtosis	-2.961e+01
original_firstorder_Maximum	-2.016e+02
original_firstorder_Mean	-7.794e+02
original_firstorder_MeanAbsoluteDeviation	1.942e+03
original_firstorder_Median	4.614e+02
original_firstorder_Minimum	1.142e+03
original_firstorder_Range	0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	-1.733e+03
original_firstorder_RootMeanSquared	-1.401e+01
original_firstorder_Skewness	2.089e+01
original_firstorder_TotalEnergy	0.000e+00
original_firstorder_Uniformity	-1.777e+03
original_firstorder_Variance	2.231e+04
original_glcm_Autocorrelation	-9.368e+03
original_glcm_ClusterProminence	3.827e+02
original_glcm_ClusterShade	2.527e+01
original_glcm_ClusterTendency	-1.578e+03
original_glcm_Contrast	1.287e+03
original_glcm_Correlation	-1.813e+02
original_glcm_DifferenceAverage	-6.992e+02
original_glcm_DifferenceEntropy	1.470e+03
original_glcm_DifferenceVariance	-1.260e+03
original_glcm_Id	1.282e+04
original_glcm_Idm	-1.395e+04
original_glcm_Idmn	-2.589e+02
original_glcm_Idn	5.320e+02
original_glcm_Imc1	-4.648e+02
original_glcm_Imc2	-7.705e+02
original_glcm_InverseVariance	6.572e+02
original_glcm_JointAverage	5.470e+02
original_glcm_JointEnergy	9.055e+02
original_glcm_JointEntropy	-2.010e+03
original_glcm_MCC	1.518e+02
original_glcm_MaximumProbability	1.078e+02
original_glcm_SumAverage	0.000e+00
original_glcm_SumEntropy	3.155e+03
original_glcm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	9.541e+02
original_gldm_DependenceNonUniformity	8.850e+02
original_gldm_DependenceNonUniformityNormalized	-2.068e+00
original_gldm_DependenceVariance	4.550e+02
original_gldm_GrayLevelNonUniformity	-1.886e+03

original_gldm_GrayLevelVariance	-2.631e+04
original_gldm_HighGrayLevelEmphasis	-1.960e+03
original_gldm_LargeDependenceEmphasis	-3.015e+03
original_gldm_LargeDependenceHighGrayLevelEmphasis	-1.357e+03
original_gldm_LargeDependenceLowGrayLevelEmphasis	-5.105e+02
original_gldm_LowGrayLevelEmphasis	1.276e+03
original_gldm_SmallDependenceEmphasis	-7.373e+02
original_gldm_SmallDependenceHighGrayLevelEmphasis	4.454e+02
original_gldm_SmallDependenceLowGrayLevelEmphasis	6.770e+01
original_glrlm_GrayLevelNonUniformity	-1.149e+02
original_glrlm_GrayLevelNonUniformityNormalized	-6.624e+02
original_glrlm_GrayLevelVariance	3.100e+03
original_glrlm_HighGrayLevelRunEmphasis	1.697e+04
original_glrlm_LongRunEmphasis	-1.439e+03
original_glrlm_LongRunHighGrayLevelEmphasis	-4.131e+02
original_glrlm_LongRunLowGrayLevelEmphasis	-2.016e+02
original_glrlm_LowGrayLevelRunEmphasis	8.340e+03
original_glrlm_RunEntropy	2.945e+02
original_glrlm_RunLengthNonUniformity	5.020e+02
original_glrlm_RunLengthNonUniformityNormalized	7.820e+03
original_glrlm_RunPercentage	-4.390e+03
original_glrlm_RunVariance	1.473e+03
original_glrlm_ShortRunEmphasis	-6.201e+03
original_glrlm_ShortRunHighGrayLevelEmphasis	-3.745e+03
original_glrlm_ShortRunLowGrayLevelEmphasis	-8.841e+03
original_glszm_GrayLevelNonUniformity	-2.117e+02
original_glszm_GrayLevelNonUniformityNormalized	5.748e+02
original_glszm_GrayLevelVariance	2.154e+02
original_glszm_HighGrayLevelZoneEmphasis	6.319e+01
original_glszm_LargeAreaEmphasis	-1.031e+05
original_glszm_LargeAreaHighGrayLevelEmphasis	7.694e+02
original_glszm_LargeAreaLowGrayLevelEmphasis	1.212e+01
original_glszm_LowGrayLevelZoneEmphasis	-1.228e+02
original_glszm_SizeZoneNonUniformity	8.692e+02
original_glszm_SizeZoneNonUniformityNormalized	7.755e+01
original_glszm_SmallAreaEmphasis	1.414e+02
original_glszm_SmallAreaHighGrayLevelEmphasis	-4.121e+02
original_glszm_SmallAreaLowGrayLevelEmphasis	3.423e+01
original_glszm_ZoneEntropy	4.867e+02
original_glszm_ZonePercentage	5.388e+02
original_glszm_ZoneVariance	1.039e+05
original_ngtdm_Busyness	1.828e+01
original_ngtdm_Coarseness	2.174e+02
original_ngtdm_Complexity	-8.607e+01
original_ngtdm_Contrast	-1.265e+02
original_ngtdm_Strength	-4.389e+01
original_shape_Elongation	9.527e+01
original_shape_Flatness	-1.546e+02
original_shape_LeastAxisLength	4.982e+02
original_shape_MajorAxisLength	9.417e+01
original_shape_Maximum2DDiameterColumn	-2.069e+02
original_shape_Maximum2DDiameterRow	2.933e+01
original_shape_Maximum2DDiameterSlice	-2.034e+01
original_shape_Maximum3DDiameter	2.023e+02
original_shape_MeshVolume	1.205e+04
original_shape_MinorAxisLength	4.928e+01
original_shape_Sphericity	-1.759e+02
original_shape_SurfaceArea	-3.146e+02
original_shape_SurfaceVolumeRatio	2.586e+02

original_shape_VoxelVolume	-1.375e+04
cluster_tree2.09671	8.509e+01
	p
original_firstorder_10Percentile	<2e-16
original_firstorder_90Percentile	<2e-16
original_firstorder_Energy	<2e-16
original_firstorder_Entropy	<2e-16
original_firstorder_InterquartileRange	<2e-16
original_firstorder_Kurtosis	<2e-16
original_firstorder_Maximum	<2e-16
original_firstorder_Mean	<2e-16
original_firstorder_MeanAbsoluteDeviation	<2e-16
original_firstorder_Median	<2e-16
original_firstorder_Minimum	<2e-16
original_firstorder_Range	1.0000
original_firstorder_RobustMeanAbsoluteDeviation	<2e-16
original_firstorder_RootMeanSquared	<2e-16
original_firstorder_Skewness	<2e-16
original_firstorder_TotalEnergy	1.0000
original_firstorder_Uniformity	<2e-16
original_firstorder_Variance	<2e-16
original_glcmm_Autocorrelation	<2e-16
original_glcmm_ClusterProminence	<2e-16
original_glcmm_ClusterShade	<2e-16
original_glcmm_ClusterTendency	<2e-16
original_glcmm_Contrast	<2e-16
original_glcmm_Correlation	<2e-16
original_glcmm_DifferenceAverage	<2e-16
original_glcmm_DifferenceEntropy	<2e-16
original_glcmm_DifferenceVariance	<2e-16
original_glcmm_Id	<2e-16
original_glcmm_Idm	<2e-16
original_glcmm_Idmn	<2e-16
original_glcmm_Idn	<2e-16
original_glcmm_Imc1	<2e-16
original_glcmm_Imc2	<2e-16
original_glcmm_InverseVariance	<2e-16
original_glcmm_JointAverage	<2e-16
original_glcmm_JointEnergy	<2e-16
original_glcmm_JointEntropy	<2e-16
original_glcmm_MCC	<2e-16
original_glcmm_MaximumProbability	<2e-16
original_glcmm_SumAverage	1.0000
original_glcmm_SumEntropy	<2e-16
original_glcmm_SumSquares	1.0000
original_gldm_DependenceEntropy	<2e-16
original_gldm_DependenceNonUniformity	<2e-16
original_gldm_DependenceNonUniformityNormalized	0.0386
original_gldm_DependenceVariance	<2e-16
original_gldm_GrayLevelNonUniformity	<2e-16
original_gldm_GrayLevelVariance	<2e-16
original_gldm_HighGrayLevelEmphasis	<2e-16
original_gldm_LargeDependenceEmphasis	<2e-16
original_gldm_LargeDependenceHighGrayLevelEmphasis	<2e-16
original_gldm_LargeDependenceLowGrayLevelEmphasis	<2e-16
original_gldm_LowGrayLevelEmphasis	<2e-16
original_gldm_SmallDependenceEmphasis	<2e-16
original_gldm_SmallDependenceHighGrayLevelEmphasis	<2e-16
original_gldm_SmallDependenceLowGrayLevelEmphasis	<2e-16

original_glrlm_GrayLevelNonUniformity	<2e-16
original_glrlm_GrayLevelNonUniformityNormalized	<2e-16
original_glrlm_GrayLevelVariance	<2e-16
original_glrlm_HighGrayLevelRunEmphasis	<2e-16
original_glrlm_LongRunEmphasis	<2e-16
original_glrlm_LongRunHighGrayLevelEmphasis	<2e-16
original_glrlm_LongRunLowGrayLevelEmphasis	<2e-16
original_glrlm_LowGrayLevelRunEmphasis	<2e-16
original_glrlm_RunEntropy	<2e-16
original_glrlm_RunLengthNonUniformity	<2e-16
original_glrlm_RunLengthNonUniformityNormalized	<2e-16
original_glrlm_RunPercentage	<2e-16
original_glrlm_RunVariance	<2e-16
original_glrlm_ShortRunEmphasis	<2e-16
original_glrlm_ShortRunHighGrayLevelEmphasis	<2e-16
original_glrlm_ShortRunLowGrayLevelEmphasis	<2e-16
original_glszm_GrayLevelNonUniformity	<2e-16
original_glszm_GrayLevelNonUniformityNormalized	<2e-16
original_glszm_GrayLevelVariance	<2e-16
original_glszm_HighGrayLevelZoneEmphasis	<2e-16
original_glszm_LargeAreaEmphasis	<2e-16
original_glszm_LargeAreaHighGrayLevelEmphasis	<2e-16
original_glszm_LargeAreaLowGrayLevelEmphasis	<2e-16
original_glszm_LowGrayLevelZoneEmphasis	<2e-16
original_glszm_SizeZoneNonUniformity	<2e-16
original_glszm_SizeZoneNonUniformityNormalized	<2e-16
original_glszm_SmallAreaEmphasis	<2e-16
original_glszm_SmallAreaHighGrayLevelEmphasis	<2e-16
original_glszm_SmallAreaLowGrayLevelEmphasis	<2e-16
original_glszm_ZoneEntropy	<2e-16
original_glszm_ZonePercentage	<2e-16
original_glszm_ZoneVariance	<2e-16
original_ngtdm_Busyness	<2e-16
original_ngtdm_Coarseness	<2e-16
original_ngtdm_Complexity	<2e-16
original_ngtdm_Contrast	<2e-16
original_ngtdm_Strength	<2e-16
original_shape_Elongation	<2e-16
original_shape_Flatness	<2e-16
original_shape_LeastAxisLength	<2e-16
original_shape_MajorAxisLength	<2e-16
original_shape_Maximum2DDiameterColumn	<2e-16
original_shape_Maximum2DDiameterRow	<2e-16
original_shape_Maximum2DDiameterSlice	<2e-16
original_shape_Maximum3DDiameter	<2e-16
original_shape_MeshVolume	<2e-16
original_shape_MinorAxisLength	<2e-16
original_shape_Sphericity	<2e-16
original_shape_SurfaceArea	<2e-16
original_shape_SurfaceVolumeRatio	<2e-16
original_shape_VoxelVolume	<2e-16
cluster_tree2.09671	<2e-16

Likelihood ratio test=463.2 on 108 df, p=< 2.2e-16  
n= 361, number of events= 40

```
$model_list[[2]]$clusters
[1] 2.09671 0.43334
```

```

$model_list[[3]]
$model_list[[3]]$treemodel
n= 361

node), split, n, deviance, yval
  * denotes terminal node

1) root 361 279.68260 1.0000000
  2) original_shape_Maximum3DDiameter< -0.006713401 227 93.88381 0.4602015 *
  3) original_shape_Maximum3DDiameter>=-0.006713401 134 159.08540 2.0108490 *
```

```
$model_list[[3]]$modcoxmodel
```

```
Call:
```

```
coxph(formula = as.formula(paste("Surv(df_train$time, df_train$event) ~",
  paste(predict.factors, collapse = "+")), data = df_train,
  x = TRUE)
```

	coef
original_firstorder_10Percentile	1.422e+01
original_firstorder_90Percentile	7.669e+00
original_firstorder_Energy	-1.736e+01
original_firstorder_Entropy	-7.374e+01
original_firstorder_InterquartileRange	-4.030e+01
original_firstorder_Kurtosis	-8.536e+00
original_firstorder_Maximum	-1.274e+00
original_firstorder_Mean	-3.991e+01
original_firstorder_MeanAbsoluteDeviation	1.199e+01
original_firstorder_Median	2.499e+01
original_firstorder_Minimum	2.225e+01
original_firstorder_Range	0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	6.066e+01
original_firstorder_RootMeanSquared	-1.405e+01
original_firstorder_Skewness	1.514e+00
original_firstorder_TotalEnergy	0.000e+00
original_firstorder_Uniformity	1.506e+01
original_firstorder_Variance	4.890e+03
original_glcmm_Autocorrelation	1.949e+02
original_glcmm_ClusterProminence	1.053e+03
original_glcmm_ClusterShade	-6.853e+01
original_glcmm_ClusterTendency	-1.822e+02
original_glcmm_Contrast	-7.590e+02
original_glcmm_Correlation	-5.587e-01
original_glcmm_DifferenceAverage	7.595e+02
original_glcmm_DifferenceEntropy	-6.815e+01
original_glcmm_DifferenceVariance	-3.857e+02
original_glcmm_Id	4.362e+03
original_glcmm_Idm	-3.803e+03
original_glcmm_Idmn	-2.075e+01
original_glcmm_Idn	2.087e+01
original_glcmm_Imc1	8.317e+00
original_glcmm_Imc2	-2.608e+01
original_glcmm_InverseVariance	3.744e+02
original_glcmm_JointAverage	-2.095e+01
original_glcmm_JointEnergy	-3.907e+01
original_glcmm_JointEntropy	-1.077e+02
original_glcmm_MCC	2.513e+00
original_glcmm_MaximumProbability	1.104e+01
original_glcmm_SumAverage	0.000e+00



original_glcm_SumEntropy	1.144e+02
original_glcm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	3.975e+01
original_gldm_DependenceNonUniformity	-3.768e+01
original_gldm_DependenceNonUniformityNormalized	9.927e+01
original_gldm_DependenceVariance	1.882e+01
original_gldm_GrayLevelNonUniformity	-1.994e+01
original_gldm_GrayLevelVariance	-4.921e+03
original_gldm_HighGrayLevelEmphasis	-4.559e+01
original_gldm_LargeDependenceEmphasis	1.174e+02
original_gldm_LargeDependenceHighGrayLevelEmphasis	-2.264e+01
original_gldm_LargeDependenceLowGrayLevelEmphasis	-8.571e+01
original_gldm_LowGrayLevelEmphasis	3.246e+02
original_gldm_SmallDependenceEmphasis	-1.816e+02
original_gldm_SmallDependenceHighGrayLevelEmphasis	6.673e+01
original_gldm_SmallDependenceLowGrayLevelEmphasis	2.083e+01
original_glrlm_GrayLevelNonUniformity	2.590e+01
original_glrlm_GrayLevelNonUniformityNormalized	4.116e+01
original_glrlm_GrayLevelVariance	1.116e+01
original_glrlm_HighGrayLevelRunEmphasis	5.395e+01
original_glrlm_LongRunEmphasis	-1.295e+02
original_glrlm_LongRunHighGrayLevelEmphasis	-6.521e+00
original_glrlm_LongRunLowGrayLevelEmphasis	-2.783e+01
original_glrlm_LowGrayLevelRunEmphasis	6.724e+01
original_glrlm_RunEntropy	1.068e+02
original_glrlm_RunLengthNonUniformity	6.643e+01
original_glrlm_RunLengthNonUniformityNormalized	-3.248e+01
original_glrlm_RunPercentage	5.541e+01
original_glrlm_RunVariance	9.008e+01
original_glrlm_ShortRunEmphasis	1.058e+02
original_glrlm_ShortRunHighGrayLevelEmphasis	-2.050e+02
original_glrlm_ShortRunLowGrayLevelEmphasis	-3.342e+02
original_glszm_GrayLevelNonUniformity	-2.278e+01
original_glszm_GrayLevelNonUniformityNormalized	-9.222e-01
original_glszm_GrayLevelVariance	1.167e+01
original_glszm_HighGrayLevelZoneEmphasis	3.523e+01
original_glszm_LargeAreaEmphasis	-7.028e+02
original_glszm_LargeAreaHighGrayLevelEmphasis	2.055e+01
original_glszm_LargeAreaLowGrayLevelEmphasis	1.693e+01
original_glszm_LowGrayLevelZoneEmphasis	-1.558e+01
original_glszm_SizeZoneNonUniformity	2.077e+01
original_glszm_SizeZoneNonUniformityNormalized	-1.095e+02
original_glszm_SmallAreaEmphasis	1.335e+02
original_glszm_SmallAreaHighGrayLevelEmphasis	-2.417e+01
original_glszm_SmallAreaLowGrayLevelEmphasis	3.396e+00
original_glszm_ZoneEntropy	-1.119e+01
original_glszm_ZonePercentage	6.785e+01
original_glszm_ZoneVariance	7.092e+02
original_ngtdm_Busyness	-4.417e+00
original_ngtdm_Coarseness	1.235e+00
original_ngtdm_Complexity	-2.011e+00
original_ngtdm_Contrast	-1.838e+00
original_ngtdm_Strength	8.477e+00
original_shape_Elongation	1.184e+01
original_shape_Flatness	-1.088e+01
original_shape_LeastAxisLength	2.911e+01
original_shape_MajorAxisLength	2.015e+01
original_shape_Maximum2DDiameterColumn	-5.093e+00
original_shape_Maximum2DDiameterRow	-3.282e+00

original_shape_Maximum2DDiameterSlice	-4.559e+00
original_shape_Maximum3DDiameter	-5.967e+00
original_shape_MeshVolume	-7.329e+02
original_shape_MinorAxisLength	-1.099e+01
original_shape_Sphericity	7.430e+00
original_shape_SurfaceArea	-1.267e+01
original_shape_SurfaceVolumeRatio	1.120e+02
original_shape_VoxelVolume	6.853e+02
cluster_tree2.010849	9.240e+00
	exp(coef)
original_firstorder_10Percentile	1.494e+06
original_firstorder_90Percentile	2.140e+03
original_firstorder_Energy	2.882e-08
original_firstorder_Entropy	9.483e-33
original_firstorder_InterquartileRange	3.163e-18
original_firstorder_Kurtosis	1.962e-04
original_firstorder_Maximum	2.798e-01
original_firstorder_Mean	4.669e-18
original_firstorder_MeanAbsoluteDeviation	1.610e+05
original_firstorder_Median	7.102e+10
original_firstorder_Minimum	4.598e+09
original_firstorder_Range	1.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	2.218e+26
original_firstorder_RootMeanSquared	7.874e-07
original_firstorder_Skewness	4.546e+00
original_firstorder_TotalEnergy	1.000e+00
original_firstorder_Uniformity	3.475e+06
original_firstorder_Variance	Inf
original_glcmm_Autocorrelation	4.320e+84
original_glcmm_ClusterProminence	Inf
original_glcmm_ClusterShade	1.726e-30
original_glcmm_ClusterTendency	7.546e-80
original_glcmm_Contrast	0.000e+00
original_glcmm_Correlation	5.720e-01
original_glcmm_DifferenceAverage	Inf
original_glcmm_DifferenceEntropy	2.533e-30
original_glcmm_DifferenceVariance	2.992e-168
original_glcmm_Id	Inf
original_glcmm_Idm	0.000e+00
original_glcmm_Idmn	9.714e-10
original_glcmm_Idn	1.157e+09
original_glcmm_Imc1	4.094e+03
original_glcmm_Imc2	4.715e-12
original_glcmm_InverseVariance	3.935e+162
original_glcmm_JointAverage	7.973e-10
original_glcmm_JointEnergy	1.075e-17
original_glcmm_JointEntropy	1.676e-47
original_glcmm_MCC	1.235e+01
original_glcmm_MaximumProbability	6.251e+04
original_glcmm_SumAverage	1.000e+00
original_glcmm_SumEntropy	4.893e+49
original_glcmm_SumSquares	1.000e+00
original_gldm_DependenceEntropy	1.829e+17
original_gldm_DependenceNonUniformity	4.337e-17
original_gldm_DependenceNonUniformityNormalized	1.296e+43
original_gldm_DependenceVariance	1.496e+08
original_gldm_GrayLevelNonUniformity	2.198e-09
original_gldm_GrayLevelVariance	0.000e+00
original_gldm_HighGrayLevelEmphasis	1.583e-20

original_gldm_LargeDependenceEmphasis	9.251e+50
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.466e-10
original_gldm_LargeDependenceLowGrayLevelEmphasis	5.984e-38
original_gldm_LowGrayLevelEmphasis	9.317e+140
original_gldm_SmallDependenceEmphasis	1.419e-79
original_gldm_SmallDependenceHighGrayLevelEmphasis	9.604e+28
original_gldm_SmallDependenceLowGrayLevelEmphasis	1.115e+09
original_glrlm_GrayLevelNonUniformity	1.776e+11
original_glrlm_GrayLevelNonUniformityNormalized	7.530e+17
original_glrlm_GrayLevelVariance	7.040e+04
original_glrlm_HighGrayLevelRunEmphasis	2.682e+23
original_glrlm_LongRunEmphasis	6.021e-57
original_glrlm_LongRunHighGrayLevelEmphasis	1.472e-03
original_glrlm_LongRunLowGrayLevelEmphasis	8.199e-13
original_glrlm_LowGrayLevelRunEmphasis	1.593e+29
original_glrlm_RunEntropy	2.316e+46
original_glrlm_RunLengthNonUniformity	7.088e+28
original_glrlm_RunLengthNonUniformityNormalized	7.863e-15
original_glrlm_RunPercentage	1.165e+24
original_glrlm_RunVariance	1.319e+39
original_glrlm_ShortRunEmphasis	9.250e+45
original_glrlm_ShortRunHighGrayLevelEmphasis	9.013e-90
original_glrlm_ShortRunLowGrayLevelEmphasis	7.573e-146
original_glszm_GrayLevelNonUniformity	1.283e-10
original_glszm_GrayLevelNonUniformityNormalized	3.976e-01
original_glszm_GrayLevelVariance	1.173e+05
original_glszm_HighGrayLevelZoneEmphasis	1.997e+15
original_glszm_LargeAreaEmphasis	6.264e-306
original_glszm_LargeAreaHighGrayLevelEmphasis	8.386e+08
original_glszm_LargeAreaLowGrayLevelEmphasis	2.263e+07
original_glszm_LowGrayLevelZoneEmphasis	1.707e-07
original_glszm_SizeZoneNonUniformity	1.044e+09
original_glszm_SizeZoneNonUniformityNormalized	2.827e-48
original_glszm_SmallAreaEmphasis	9.351e+57
original_glszm_SmallAreaHighGrayLevelEmphasis	3.194e-11
original_glszm_SmallAreaLowGrayLevelEmphasis	2.984e+01
original_glszm_ZoneEntropy	1.377e-05
original_glszm_ZonePercentage	2.916e+29
original_glszm_ZoneVariance	1.050e+308
original_ngtdm_Busyness	1.207e-02
original_ngtdm_Coarseness	3.440e+00
original_ngtdm_Complexity	1.338e-01
original_ngtdm_Contrast	1.592e-01
original_ngtdm_Strength	4.805e+03
original_shape_Elongation	1.380e+05
original_shape_Flatness	1.879e-05
original_shape_LeastAxisLength	4.407e+12
original_shape_MajorAxisLength	5.644e+08
original_shape_Maximum2DDiameterColumn	6.139e-03
original_shape_Maximum2DDiameterRow	3.757e-02
original_shape_Maximum2DDiameterSlice	1.047e-02
original_shape_Maximum3DDiameter	2.562e-03
original_shape_MeshVolume	5.336e-319
original_shape_MinorAxisLength	1.695e-05
original_shape_Sphericity	1.686e+03
original_shape_SurfaceArea	3.136e-06
original_shape_SurfaceVolumeRatio	4.422e+48
original_shape_VoxelVolume	4.274e+297
cluster_tree2.010849	1.030e+04

	se(coef)
original_firstorder_10Percentile	1.234e+01
original_firstorder_90Percentile	1.486e+01
original_firstorder_Energy	5.566e+00
original_firstorder_Entropy	9.302e+01
original_firstorder_InterquartileRange	2.428e+01
original_firstorder_Kurtosis	2.474e+00
original_firstorder_Maximum	2.194e+00
original_firstorder_Mean	3.431e+01
original_firstorder_MeanAbsoluteDeviation	4.563e+01
original_firstorder_Median	1.839e+01
original_firstorder_Minimum	2.215e+01
original_firstorder_Range	0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	3.238e+01
original_firstorder_RootMeanSquared	1.218e+01
original_firstorder_Skewness	1.917e+00
original_firstorder_TotalEnergy	0.000e+00
original_firstorder_Uniformity	4.033e+01
original_firstorder_Variance	1.546e+03
original_glcmm_Autocorrelation	2.682e+02
original_glcmm_ClusterProminence	3.010e+02
original_glcmm_ClusterShade	4.617e+01
original_glcmm_ClusterTendency	6.022e+01
original_glcmm_Contrast	5.766e+02
original_glcmm_Correlation	2.624e+00
original_glcmm_DifferenceAverage	2.330e+02
original_glcmm_DifferenceEntropy	3.805e+01
original_glcmm_DifferenceVariance	3.933e+02
original_glcmm_Id	1.299e+03
original_glcmm_Idm	1.105e+03
original_glcmm_Idmn	8.956e+00
original_glcmm_Idn	9.127e+00
original_glcmm_Imc1	8.303e+00
original_glcmm_Imc2	9.605e+00
original_glcmm_InverseVariance	1.127e+02
original_glcmm_JointAverage	2.694e+01
original_glcmm_JointEnergy	2.954e+01
original_glcmm_JointEntropy	4.432e+01
original_glcmm_MCC	2.403e+00
original_glcmm_MaximumProbability	4.114e+00
original_glcmm_SumAverage	0.000e+00
original_glcmm_SumEntropy	4.633e+01
original_glcmm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	2.669e+01
original_gldm_DependenceNonUniformity	1.409e+01
original_gldm_DependenceNonUniformityNormalized	2.479e+01
original_gldm_DependenceVariance	1.412e+01
original_gldm_GrayLevelNonUniformity	1.043e+01
original_gldm_GrayLevelVariance	1.549e+03
original_gldm_HighGrayLevelEmphasis	2.823e+02
original_gldm_LargeDependenceEmphasis	6.917e+01
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.472e+01
original_gldm_LargeDependenceLowGrayLevelEmphasis	3.795e+01
original_gldm_LowGrayLevelEmphasis	1.082e+02
original_gldm_SmallDependenceEmphasis	5.657e+01
original_gldm_SmallDependenceHighGrayLevelEmphasis	2.021e+01
original_gldm_SmallDependenceLowGrayLevelEmphasis	1.020e+01
original_glrmm_GrayLevelNonUniformity	1.277e+01
original_glrmm_GrayLevelNonUniformityNormalized	1.665e+01

original_glrlm_GrayLevelVariance	5.476e+01
original_glrlm_HighGrayLevelRunEmphasis	1.822e+02
original_glrlm_LongRunEmphasis	5.278e+01
original_glrlm_LongRunHighGrayLevelEmphasis	5.688e+00
original_glrlm_LongRunLowGrayLevelEmphasis	9.234e+00
original_glrlm_LowGrayLevelRunEmphasis	1.335e+02
original_glrlm_RunEntropy	7.154e+01
original_glrlm_RunLengthNonUniformity	1.860e+01
original_glrlm_RunLengthNonUniformityNormalized	7.968e+01
original_glrlm_RunPercentage	1.163e+02
original_glrlm_RunVariance	4.288e+01
original_glrlm_ShortRunEmphasis	7.526e+01
original_glrlm_ShortRunHighGrayLevelEmphasis	7.860e+01
original_glrlm_ShortRunLowGrayLevelEmphasis	1.362e+02
original_glszm_GrayLevelNonUniformity	7.253e+00
original_glszm_GrayLevelNonUniformityNormalized	4.418e+00
original_glszm_GrayLevelVariance	7.417e+00
original_glszm_HighGrayLevelZoneEmphasis	3.117e+01
original_glszm_LargeAreaEmphasis	6.886e+02
original_glszm_LargeAreaHighGrayLevelEmphasis	5.522e+00
original_glszm_LargeAreaLowGrayLevelEmphasis	9.113e+00
original_glszm_LowGrayLevelZoneEmphasis	1.499e+01
original_glszm_SizeZoneNonUniformity	7.308e+00
original_glszm_SizeZoneNonUniformityNormalized	3.364e+01
original_glszm_SmallAreaEmphasis	3.812e+01
original_glszm_SmallAreaHighGrayLevelEmphasis	1.972e+01
original_glszm_SmallAreaLowGrayLevelEmphasis	9.026e+00
original_glszm_ZoneEntropy	6.887e+00
original_glszm_ZonePercentage	2.982e+01
original_glszm_ZoneVariance	6.880e+02
original_ngtdm_Busyness	7.071e+00
original_ngtdm_Coarseness	2.010e+00
original_ngtdm_Complexity	7.769e+00
original_ngtdm_Contrast	1.483e+01
original_ngtdm_Strength	5.042e+00
original_shape_Elongation	4.013e+00
original_shape_Flatness	4.945e+00
original_shape_LeastAxisLength	1.027e+01
original_shape_MajorAxisLength	5.136e+00
original_shape_Maximum2DDiameterColumn	2.845e+00
original_shape_Maximum2DDiameterRow	2.088e+00
original_shape_Maximum2DDiameterSlice	2.306e+00
original_shape_Maximum3DDiameter	4.447e+00
original_shape_MeshVolume	3.469e+02
original_shape_MinorAxisLength	5.479e+00
original_shape_Sphericity	7.117e+00
original_shape_SurfaceArea	4.623e+00
original_shape_SurfaceVolumeRatio	4.971e+01
original_shape_VoxelVolume	3.449e+02
cluster_tree2.010849	2.801e+00
z	
original_firstorder_10Percentile	1.152
original_firstorder_90Percentile	0.516
original_firstorder_Energy	-3.120
original_firstorder_Entropy	-0.793
original_firstorder_InterquartileRange	-1.659
original_firstorder_Kurtosis	-3.451
original_firstorder_Maximum	-0.581
original_firstorder_Mean	-1.163

original_firstorder_MeanAbsoluteDeviation	0.263
original_firstorder_Median	1.358
original_firstorder_Minimum	1.005
original_firstorder_Range	NaN
original_firstorder_RobustMeanAbsoluteDeviation	1.873
original_firstorder_RootMeanSquared	-1.154
original_firstorder_Skewness	0.790
original_firstorder_TotalEnergy	NaN
original_firstorder_Uniformity	0.373
original_firstorder_Variance	3.162
original_glcm_Autocorrelation	0.727
original_glcm_ClusterProminence	3.498
original_glcm_ClusterShade	-1.484
original_glcm_ClusterTendency	-3.026
original_glcm_Contrast	-1.316
original_glcm_Correlation	-0.213
original_glcm_DifferenceAverage	3.260
original_glcm_DifferenceEntropy	-1.791
original_glcm_DifferenceVariance	-0.981
original_glcm_Id	3.357
original_glcm_Idm	-3.442
original_glcm_Idmn	-2.317
original_glcm_Idn	2.287
original_glcm_Imc1	1.002
original_glcm_Imc2	-2.715
original_glcm_InverseVariance	3.322
original_glcm_JointAverage	-0.778
original_glcm_JointEnergy	-1.323
original_glcm_JointEntropy	-2.430
original_glcm_MCC	1.046
original_glcm_MaximumProbability	2.684
original_glcm_SumAverage	NaN
original_glcm_SumEntropy	2.470
original_glcm_SumSquares	NaN
original_gldm_DependenceEntropy	1.490
original_gldm_DependenceNonUniformity	-2.674
original_gldm_DependenceNonUniformityNormalized	4.004
original_gldm_DependenceVariance	1.333
original_gldm_GrayLevelNonUniformity	-1.911
original_gldm_GrayLevelVariance	-3.176
original_gldm_HighGrayLevelEmphasis	-0.162
original_gldm_LargeDependenceEmphasis	1.697
original_gldm_LargeDependenceHighGrayLevelEmphasis	-1.538
original_gldm_LargeDependenceLowGrayLevelEmphasis	-2.259
original_gldm_LowGrayLevelEmphasis	3.001
original_gldm_SmallDependenceEmphasis	-3.209
original_gldm_SmallDependenceHighGrayLevelEmphasis	3.302
original_gldm_SmallDependenceLowGrayLevelEmphasis	2.042
original_glrlm_GrayLevelNonUniformity	2.028
original_glrlm_GrayLevelNonUniformityNormalized	2.472
original_glrlm_GrayLevelVariance	0.204
original_glrlm_HighGrayLevelRunEmphasis	0.296
original_glrlm_LongRunEmphasis	-2.453
original_glrlm_LongRunHighGrayLevelEmphasis	-1.147
original_glrlm_LongRunLowGrayLevelEmphasis	-3.014
original_glrlm_LowGrayLevelRunEmphasis	0.504
original_glrlm_RunEntropy	1.492
original_glrlm_RunLengthNonUniformity	3.571
original_glrlm_RunLengthNonUniformityNormalized	-0.408

original_glrlm_RunPercentage	0.476
original_glrlm_RunVariance	2.101
original_glrlm_ShortRunEmphasis	1.406
original_glrlm_ShortRunHighGrayLevelEmphasis	-2.609
original_glrlm_ShortRunLowGrayLevelEmphasis	-2.454
original_glszm_GrayLevelNonUniformity	-3.141
original_glszm_GrayLevelNonUniformityNormalized	-0.209
original_glszm_GrayLevelVariance	1.574
original_glszm_HighGrayLevelZoneEmphasis	1.130
original_glszm_LargeAreaEmphasis	-1.021
original_glszm_LargeAreaHighGrayLevelEmphasis	3.721
original_glszm_LargeAreaLowGrayLevelEmphasis	1.858
original_glszm_LowGrayLevelZoneEmphasis	-1.039
original_glszm_SizeZoneNonUniformity	2.841
original_glszm_SizeZoneNonUniformityNormalized	-3.254
original_glszm_SmallAreaEmphasis	3.502
original_glszm_SmallAreaHighGrayLevelEmphasis	-1.226
original_glszm_SmallAreaLowGrayLevelEmphasis	0.376
original_glszm_ZoneEntropy	-1.625
original_glszm_ZonePercentage	2.275
original_glszm_ZoneVariance	1.031
original_ngtdm_Busyness	-0.625
original_ngtdm_Coarseness	0.615
original_ngtdm_Complexity	-0.259
original_ngtdm_Contrast	-0.124
original_ngtdm_Strength	1.681
original_shape_Elongation	2.949
original_shape_Flatness	-2.201
original_shape_LeastAxisLength	2.835
original_shape_MajorAxisLength	3.924
original_shape_Maximum2DDiameterColumn	-1.790
original_shape_Maximum2DDiameterRow	-1.572
original_shape_Maximum2DDiameterSlice	-1.977
original_shape_Maximum3DDiameter	-1.342
original_shape_MeshVolume	-2.112
original_shape_MinorAxisLength	-2.005
original_shape_Sphericity	1.044
original_shape_SurfaceArea	-2.741
original_shape_SurfaceVolumeRatio	2.253
original_shape_VoxelVolume	1.987
cluster_tree2.010849	3.299

p

original_firstorder_10Percentile	0.249306
original_firstorder_90Percentile	0.605775
original_firstorder_Energy	0.001811
original_firstorder_Entropy	0.427956
original_firstorder_InterquartileRange	0.097038
original_firstorder_Kurtosis	0.000559
original_firstorder_Maximum	0.561511
original_firstorder_Mean	0.244796
original_firstorder_MeanAbsoluteDeviation	0.792729
original_firstorder_Median	0.174362
original_firstorder_Minimum	0.315089
original_firstorder_Range	NaN
original_firstorder_RobustMeanAbsoluteDeviation	0.061004
original_firstorder_RootMeanSquared	0.248355
original_firstorder_Skewness	0.429669
original_firstorder_TotalEnergy	NaN
original_firstorder_Uniformity	0.708847

original_firstorder_Variance	0.001565
original_glcmm_Autocorrelation	0.467430
original_glcmm_ClusterProminence	0.000469
original_glcmm_ClusterShade	0.137717
original_glcmm_ClusterTendency	0.002482
original_glcmm_Contrast	0.188048
original_glcmm_Correlation	0.831379
original_glcmm_DifferenceAverage	0.001114
original_glcmm_DifferenceEntropy	0.073318
original_glcmm_DifferenceVariance	0.326695
original_glcmm_Id	0.000788
original_glcmm_Idm	0.000578
original_glcmm_Idmn	0.020501
original_glcmm_Idn	0.022223
original_glcmm_Imc1	0.316466
original_glcmm_Imc2	0.006620
original_glcmm_InverseVariance	0.000895
original_glcmm_JointAverage	0.436714
original_glcmm_JointEnergy	0.185959
original_glcmm_JointEntropy	0.015095
original_glcmm_MCC	0.295533
original_glcmm_MaximumProbability	0.007274
original_glcmm_SumAverage	NaN
original_glcmm_SumEntropy	0.013519
original_glcmm_SumSquares	NaN
original_gldm_DependenceEntropy	0.136356
original_gldm_DependenceNonUniformity	0.007491
original_gldm_DependenceNonUniformityNormalized	6.23e-05
original_gldm_DependenceVariance	0.182632
original_gldm_GrayLevelNonUniformity	0.055981
original_gldm_GrayLevelVariance	0.001491
original_gldm_HighGrayLevelEmphasis	0.871692
original_gldm_LargeDependenceEmphasis	0.089752
original_gldm_LargeDependenceHighGrayLevelEmphasis	0.123975
original_gldm_LargeDependenceLowGrayLevelEmphasis	0.023913
original_gldm_LowGrayLevelEmphasis	0.002689
original_gldm_SmallDependenceEmphasis	0.001330
original_gldm_SmallDependenceHighGrayLevelEmphasis	0.000958
original_gldm_SmallDependenceLowGrayLevelEmphasis	0.041172
original_glrlm_GrayLevelNonUniformity	0.042574
original_glrlm_GrayLevelNonUniformityNormalized	0.013454
original_glrlm_GrayLevelVariance	0.838469
original_glrlm_HighGrayLevelRunEmphasis	0.767109
original_glrlm_LongRunEmphasis	0.014179
original_glrlm_LongRunHighGrayLevelEmphasis	0.251539
original_glrlm_LongRunLowGrayLevelEmphasis	0.002580
original_glrlm_LowGrayLevelRunEmphasis	0.614533
original_glrlm_RunEntropy	0.135632
original_glrlm_RunLengthNonUniformity	0.000356
original_glrlm_RunLengthNonUniformityNormalized	0.683584
original_glrlm_RunPercentage	0.633760
original_glrlm_RunVariance	0.035652
original_glrlm_ShortRunEmphasis	0.159636
original_glrlm_ShortRunHighGrayLevelEmphasis	0.009089
original_glrlm_ShortRunLowGrayLevelEmphasis	0.014135
original_glszm_GrayLevelNonUniformity	0.001686
original_glszm_GrayLevelNonUniformityNormalized	0.834641
original_glszm_GrayLevelVariance	0.115577
original_glszm_HighGrayLevelZoneEmphasis	0.258402



original_glszm_LargeAreaEmphasis	0.307438
original_glszm_LargeAreaHighGrayLevelEmphasis	0.000199
original_glszm_LargeAreaLowGrayLevelEmphasis	0.063137
original_glszm_LowGrayLevelZoneEmphasis	0.298588
original_glszm_SizeZoneNonUniformity	0.004491
original_glszm_SizeZoneNonUniformityNormalized	0.001137
original_glszm_SmallAreaEmphasis	0.000462
original_glszm_SmallAreaHighGrayLevelEmphasis	0.220277
original_glszm_SmallAreaLowGrayLevelEmphasis	0.706735
original_glszm_ZoneEntropy	0.104097
original_glszm_ZonePercentage	0.022893
original_glszm_ZoneVariance	0.302614
original_ngtdm_Busyness	0.532210
original_ngtdm_Coarseness	0.538832
original_ngtdm_Complexity	0.795740
original_ngtdm_Contrast	0.901387
original_ngtdm_Strength	0.092713
original_shape_Elongation	0.003184
original_shape_Flatness	0.027755
original_shape_LeastAxisLength	0.004584
original_shape_MajorAxisLength	8.73e-05
original_shape_Maximum2DDiameterColumn	0.073436
original_shape_Maximum2DDiameterRow	0.116038
original_shape_Maximum2DDiameterSlice	0.047998
original_shape_Maximum3DDiameter	0.179718
original_shape_MeshVolume	0.034649
original_shape_MinorAxisLength	0.044963
original_shape_Sphericity	0.296495
original_shape_SurfaceArea	0.006120
original_shape_SurfaceVolumeRatio	0.024254
original_shape_VoxelVolume	0.046951
cluster_tree2.010849	0.000971

Likelihood ratio test=262.1 on 108 df, p=7.971e-15  
n= 361, number of events= 48

\$model\_list[[3]]\$clusters  
[1] 2.010849 0.460201

\$model\_list[[4]]  
\$model\_list[[4]]\$treemodel  
n= 360

node), split, n, deviance, yval  
\* denotes terminal node

- 1) root 360 251.34380 1.0000000
- 2) original\_glszm\_GrayLevelVariance< 0.04229695 234 73.02744 0.3782755 \*
- 3) original\_glszm\_GrayLevelVariance>=0.04229695 126 144.79850 2.2987410 \*

\$model\_list[[4]]\$modcoxmodel  
Call:  
coxph(formula = as.formula(paste("Surv(df\_train\$time, df\_train\$event) ~",  
paste(predict.factors, collapse = "+"))), data = df\_train,  
x = TRUE)

	coef
original_firstorder_10Percentile	2.360e+01

original_firstorder_90Percentile	2.518e+01
original_firstorder_Energy	1.497e+00
original_firstorder_Entropy	-4.684e+01
original_firstorder_InterquartileRange	-5.027e+01
original_firstorder_Kurtosis	2.741e+00
original_firstorder_Maximum	-9.353e-01
original_firstorder_Mean	-4.608e+01
original_firstorder_MeanAbsoluteDeviation	-2.690e+01
original_firstorder_Median	-8.948e+00
original_firstorder_Minimum	1.054e+02
original_firstorder_Range	0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	3.351e+01
original_firstorder_RootMeanSquared	1.029e+01
original_firstorder_Skewness	-1.701e+00
original_firstorder_TotalEnergy	0.000e+00
original_firstorder_Uniformity	-7.023e+01
original_firstorder_Variance	3.701e+03
original_glcml_Autocorrelation	-7.198e+02
original_glcml_ClusterProminence	-6.709e+02
original_glcml_ClusterShade	1.331e+02
original_glcml_ClusterTendency	7.267e+01
original_glcml_Contrast	5.555e+02
original_glcml_Correlation	-1.259e+01
original_glcml_DifferenceAverage	-4.169e+02
original_glcml_DifferenceEntropy	-3.224e+01
original_glcml_DifferenceVariance	-2.498e+01
original_glcml_Id	-2.689e+03
original_glcml_Idm	2.260e+03
original_glcml_Idmn	-1.287e+01
original_glcml_Idn	1.821e+01
original_glcml_Imc1	2.412e+01
original_glcml_Imc2	2.751e+01
original_glcml_InverseVariance	-2.418e+02
original_glcml_JointAverage	1.135e+02
original_glcml_JointEnergy	1.610e+01
original_glcml_JointEntropy	8.771e+01
original_glcml_MCC	-4.485e+00
original_glcml_MaximumProbability	4.868e+00
original_glcml_SumAverage	0.000e+00
original_glcml_SumEntropy	-5.219e+01
original_glcml_SumSquares	0.000e+00
original_gldm_DependenceEntropy	-6.197e+01
original_gldm_DependenceNonUniformity	6.395e-01
original_gldm_DependenceNonUniformityNormalized	2.578e+01
original_gldm_DependenceVariance	-5.041e+01
original_gldm_GrayLevelNonUniformity	-3.707e+00
original_gldm_GrayLevelVariance	-3.420e+03
original_gldm_HighGrayLevelEmphasis	1.588e+03
original_gldm_LargeDependenceEmphasis	1.146e+02
original_gldm_LargeDependenceHighGrayLevelEmphasis	5.867e+01
original_gldm_LargeDependenceLowGrayLevelEmphasis	-2.318e+02
original_gldm_LowGrayLevelEmphasis	-9.376e+01
original_gldm_SmallDependenceEmphasis	1.229e+02
original_gldm_SmallDependenceHighGrayLevelEmphasis	-2.528e+01
original_gldm_SmallDependenceLowGrayLevelEmphasis	6.410e+01
original_glrlm_GrayLevelNonUniformity	2.046e+01
original_glrlm_GrayLevelNonUniformityNormalized	1.163e+01
original_glrlm_GrayLevelVariance	-1.335e+02
original_glrlm_HighGrayLevelRunEmphasis	-1.141e+03

original_glrlm_LongRunEmphasis	1.193e+02
original_glrlm_LongRunHighGrayLevelEmphasis	1.237e+01
original_glrlm_LongRunLowGrayLevelEmphasis	2.126e+01
original_glrlm_LowGrayLevelRunEmphasis	1.099e+03
original_glrlm_RunEntropy	7.509e+01
original_glrlm_RunLengthNonUniformity	1.513e+01
original_glrlm_RunLengthNonUniformityNormalized	-3.482e+02
original_glrlm_RunPercentage	1.945e+01
original_glrlm_RunVariance	-1.669e+02
original_glrlm_ShortRunEmphasis	2.890e+02
original_glrlm_ShortRunHighGrayLevelEmphasis	2.625e+02
original_glrlm_ShortRunLowGrayLevelEmphasis	-8.719e+02
original_glszm_GrayLevelNonUniformity	-8.000e+00
original_glszm_GrayLevelNonUniformityNormalized	1.173e+01
original_glszm_GrayLevelVariance	6.384e-01
original_glszm_HighGrayLevelZoneEmphasis	-9.295e+01
original_glszm_LargeAreaEmphasis	-1.556e+03
original_glszm_LargeAreaHighGrayLevelEmphasis	2.825e+00
original_glszm_LargeAreaLowGrayLevelEmphasis	4.978e+01
original_glszm_LowGrayLevelZoneEmphasis	-5.852e+01
original_glszm_SizeZoneNonUniformity	2.783e+00
original_glszm_SizeZoneNonUniformityNormalized	-7.435e+00
original_glszm_SmallAreaEmphasis	-2.277e+01
original_glszm_SmallAreaHighGrayLevelEmphasis	7.829e+01
original_glszm_SmallAreaLowGrayLevelEmphasis	6.444e+00
original_glszm_ZoneEntropy	-1.109e+01
original_glszm_ZonePercentage	-1.632e+02
original_glszm_ZoneVariance	1.555e+03
original_ngtdm_Busyness	-3.228e+01
original_ngtdm_Coarseness	-7.831e+00
original_ngtdm_Complexity	-1.383e+01
original_ngtdm_Contrast	-4.148e+01
original_ngtdm_Strength	1.799e+01
original_shape_Elongation	-5.835e-01
original_shape_Flatness	2.134e+00
original_shape_LeastAxisLength	3.916e+00
original_shape_MajorAxisLength	1.221e+00
original_shape_Maximum2DDiameterColumn	-5.888e+00
original_shape_Maximum2DDiameterRow	6.163e+00
original_shape_Maximum2DDiameterSlice	-1.372e-01
original_shape_Maximum3DDiameter	1.489e+01
original_shape_MeshVolume	2.361e+03
original_shape_MinorAxisLength	1.166e+01
original_shape_Sphericity	5.668e+00
original_shape_SurfaceArea	1.714e+01
original_shape_SurfaceVolumeRatio	1.158e+02
original_shape_VoxelVolume	-2.404e+03
cluster_tree2.298741	1.601e+01
	exp(coef)
original_firstorder_10Percentile	1.784e+10
original_firstorder_90Percentile	8.624e+10
original_firstorder_Energy	4.469e+00
original_firstorder_Entropy	4.529e-21
original_firstorder_InterquartileRange	1.471e-22
original_firstorder_Kurtosis	1.551e+01
original_firstorder_Maximum	3.925e-01
original_firstorder_Mean	9.751e-21
original_firstorder_MeanAbsoluteDeviation	2.084e-12
original_firstorder_Median	1.300e-04

original_firstorder_Minimum	6.233e+45
original_firstorder_Range	1.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	3.591e+14
original_firstorder_RootMeanSquared	2.957e+04
original_firstorder_Skewness	1.826e-01
original_firstorder_TotalEnergy	1.000e+00
original_firstorder_Uniformity	3.170e-31
original_firstorder_Variance	Inf
original_glcmm_Autocorrelation	2.364e-313
original_glcmm_ClusterProminence	4.190e-292
original_glcmm_ClusterShade	6.684e+57
original_glcmm_ClusterTendency	3.644e+31
original_glcmm_Contrast	1.712e+241
original_glcmm_Correlation	3.400e-06
original_glcmm_DifferenceAverage	8.622e-182
original_glcmm_DifferenceEntropy	9.934e-15
original_glcmm_DifferenceVariance	1.424e-11
original_glcmm_Id	0.000e+00
original_glcmm_Idm	Inf
original_glcmm_Idmn	2.570e-06
original_glcmm_Idn	8.066e+07
original_glcmm_Imc1	2.990e+10
original_glcmm_Imc2	8.866e+11
original_glcmm_InverseVariance	9.404e-106
original_glcmm_JointAverage	1.979e+49
original_glcmm_JointEnergy	9.803e+06
original_glcmm_JointEntropy	1.230e+38
original_glcmm_MCC	1.128e-02
original_glcmm_MaximumProbability	1.300e+02
original_glcmm_SumAverage	1.000e+00
original_glcmm_SumEntropy	2.150e-23
original_glcmm_SumSquares	1.000e+00
original_gldm_DependenceEntropy	1.221e-27
original_gldm_DependenceNonUniformity	1.895e+00
original_gldm_DependenceNonUniformityNormalized	1.565e+11
original_gldm_DependenceVariance	1.277e-22
original_gldm_GrayLevelNonUniformity	2.456e-02
original_gldm_GrayLevelVariance	0.000e+00
original_gldm_HighGrayLevelEmphasis	Inf
original_gldm_LargeDependenceEmphasis	5.844e+49
original_gldm_LargeDependenceHighGrayLevelEmphasis	3.018e+25
original_gldm_LargeDependenceLowGrayLevelEmphasis	2.129e-101
original_gldm_LowGrayLevelEmphasis	1.904e-41
original_gldm_SmallDependenceEmphasis	2.411e+53
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.054e-11
original_gldm_SmallDependenceLowGrayLevelEmphasis	6.872e+27
original_glrlm_GrayLevelNonUniformity	7.672e+08
original_glrlm_GrayLevelNonUniformityNormalized	1.124e+05
original_glrlm_GrayLevelVariance	1.105e-58
original_glrlm_HighGrayLevelRunEmphasis	0.000e+00
original_glrlm_LongRunEmphasis	6.431e+51
original_glrlm_LongRunHighGrayLevelEmphasis	2.354e+05
original_glrlm_LongRunLowGrayLevelEmphasis	1.712e+09
original_glrlm_LowGrayLevelRunEmphasis	Inf
original_glrlm_RunEntropy	4.080e+32
original_glrlm_RunLengthNonUniformity	3.725e+06
original_glrlm_RunLengthNonUniformityNormalized	6.001e-152
original_glrlm_RunPercentage	2.804e+08
original_glrlm_RunVariance	3.448e-73

original_glrlm_ShortRunEmphasis	3.340e+125
original_glrlm_ShortRunHighGrayLevelEmphasis	9.646e+113
original_glrlm_ShortRunLowGrayLevelEmphasis	0.000e+00
original_glszm_GrayLevelNonUniformity	3.353e-04
original_glszm_GrayLevelNonUniformityNormalized	1.237e+05
original_glszm_GrayLevelVariance	1.894e+00
original_glszm_HighGrayLevelZoneEmphasis	4.302e-41
original_glszm_LargeAreaEmphasis	0.000e+00
original_glszm_LargeAreaHighGrayLevelEmphasis	1.685e+01
original_glszm_LargeAreaLowGrayLevelEmphasis	4.145e+21
original_glszm_LowGrayLevelZoneEmphasis	3.832e-26
original_glszm_SizeZoneNonUniformity	1.616e+01
original_glszm_SizeZoneNonUniformityNormalized	5.901e-04
original_glszm_SmallAreaEmphasis	1.289e-10
original_glszm_SmallAreaHighGrayLevelEmphasis	1.007e+34
original_glszm_SmallAreaLowGrayLevelEmphasis	6.292e+02
original_glszm_ZoneEntropy	1.531e-05
original_glszm_ZonePercentage	1.354e-71
original_glszm_ZoneVariance	Inf
original_ngtdm_Busyness	9.593e-15
original_ngtdm_Coarseness	3.973e-04
original_ngtdm_Complexity	9.861e-07
original_ngtdm_Contrast	9.695e-19
original_ngtdm_Strength	6.524e+07
original_shape_Elongation	5.579e-01
original_shape_Flatness	8.446e+00
original_shape_LeastAxisLength	5.019e+01
original_shape_MajorAxisLength	3.390e+00
original_shape_Maximum2DDiameterColumn	2.771e-03
original_shape_Maximum2DDiameterRow	4.747e+02
original_shape_Maximum2DDiameterSlice	8.718e-01
original_shape_Maximum3DDiameter	2.916e+06
original_shape_MeshVolume	Inf
original_shape_MinorAxisLength	1.159e+05
original_shape_Sphericity	2.895e+02
original_shape_SurfaceArea	2.781e+07
original_shape_SurfaceVolumeRatio	1.930e+50
original_shape_VoxelVolume	0.000e+00
cluster_tree2.298741	9.012e+06
	se(coef)
original_firstorder_10Percentile	1.422e-01
original_firstorder_90Percentile	9.383e-02
original_firstorder_Energy	1.213e-01
original_firstorder_Entropy	1.369e-01
original_firstorder_InterquartileRange	1.494e-01
original_firstorder_Kurtosis	1.301e-01
original_firstorder_Maximum	1.436e-01
original_firstorder_Mean	1.425e-01
original_firstorder_MeanAbsoluteDeviation	1.358e-01
original_firstorder_Median	1.572e-01
original_firstorder_Minimum	1.600e-01
original_firstorder_Range	1.453e-01
original_firstorder_RobustMeanAbsoluteDeviation	1.544e-01
original_firstorder_RootMeanSquared	1.384e-01
original_firstorder_Skewness	1.420e-01
original_firstorder_TotalEnergy	1.213e-01
original_firstorder_Uniformity	1.430e-01
original_firstorder_Variance	2.310e-01
original_glcmm_Autocorrelation	1.570e-01

original_glcm_ClusterProminence	1.734e+00
original_glcm_ClusterShade	3.761e-01
original_glcm_ClusterTendency	2.005e-01
original_glcm_Contrast	8.150e-01
original_glcm_Correlation	1.566e-01
original_glcm_DifferenceAverage	1.580e-01
original_glcm_DifferenceEntropy	1.458e-01
original_glcm_DifferenceVariance	1.026e+00
original_glcm_Id	1.394e-01
original_glcm_Idm	1.388e-01
original_glcm_Idmn	1.679e-01
original_glcm_Idn	1.477e-01
original_glcm_Imc1	1.538e-01
original_glcm_Imc2	1.741e-01
original_glcm_InverseVariance	1.410e-01
original_glcm_JointAverage	1.544e-01
original_glcm_JointEnergy	1.474e-01
original_glcm_JointEntropy	1.352e-01
original_glcm_MCC	1.882e-01
original_glcm_MaximumProbability	1.453e-01
original_glcm_SumAverage	1.544e-01
original_glcm_SumEntropy	1.384e-01
original_glcm_SumSquares	2.420e-01
original_gldm_DependenceEntropy	1.365e-01
original_gldm_DependenceNonUniformity	1.187e-01
original_gldm_DependenceNonUniformityNormalized	1.600e-01
original_gldm_DependenceVariance	1.538e-01
original_gldm_GrayLevelNonUniformity	9.831e-02
original_gldm_GrayLevelVariance	2.306e-01
original_gldm_HighGrayLevelEmphasis	1.571e-01
original_gldm_LargeDependenceEmphasis	1.649e-01
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.262e-01
original_gldm_LargeDependenceLowGrayLevelEmphasis	3.637e-01
original_gldm_LowGrayLevelEmphasis	1.032e-01
original_gldm_SmallDependenceEmphasis	1.743e-01
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.474e-01
original_gldm_SmallDependenceLowGrayLevelEmphasis	1.185e-01
original_glrlm_GrayLevelNonUniformity	1.033e-01
original_glrlm_GrayLevelNonUniformityNormalized	1.308e-01
original_glrlm_GrayLevelVariance	2.175e-01
original_glrlm_HighGrayLevelRunEmphasis	1.568e-01
original_glrlm_LongRunEmphasis	2.050e-01
original_glrlm_LongRunHighGrayLevelEmphasis	1.344e-01
original_glrlm_LongRunLowGrayLevelEmphasis	2.107e-01
original_glrlm_LowGrayLevelRunEmphasis	1.073e-01
original_glrlm_RunEntropy	1.331e-01
original_glrlm_RunLengthNonUniformity	1.107e-01
original_glrlm_RunLengthNonUniformityNormalized	1.630e-01
original_glrlm_RunPercentage	1.652e-01
original_glrlm_RunVariance	2.095e-01
original_glrlm_ShortRunEmphasis	1.661e-01
original_glrlm_ShortRunHighGrayLevelEmphasis	1.626e-01
original_glrlm_ShortRunLowGrayLevelEmphasis	9.616e-02
original_glszm_GrayLevelNonUniformity	1.215e-01
original_glszm_GrayLevelNonUniformityNormalized	1.313e-01
original_glszm_GrayLevelVariance	1.479e-01
original_glszm_HighGrayLevelZoneEmphasis	1.525e-01
original_glszm_LargeAreaEmphasis	1.006e-01
original_glszm_LargeAreaHighGrayLevelEmphasis	7.543e-02

original_glszm_LargeAreaLowGrayLevelEmphasis	4.243e-01
original_glszm_LowGrayLevelZoneEmphasis	1.652e-01
original_glszm_SizeZoneNonUniformity	1.111e-01
original_glszm_SizeZoneNonUniformityNormalized	1.446e-01
original_glszm_SmallAreaEmphasis	1.345e-01
original_glszm_SmallAreaHighGrayLevelEmphasis	1.437e-01
original_glszm_SmallAreaLowGrayLevelEmphasis	1.949e-01
original_glszm_ZoneEntropy	1.496e-01
original_glszm_ZonePercentage	1.717e-01
original_glszm_ZoneVariance	1.005e-01
original_ngtdm_Busyness	3.496e-01
original_ngtdm_Coarseness	8.901e-02
original_ngtdm_Complexity	2.046e-01
original_ngtdm_Contrast	4.642e-01
original_ngtdm_Strength	3.960e-01
original_shape_Elongation	1.552e-01
original_shape_Flatness	1.708e-01
original_shape_LeastAxisLength	1.251e-01
original_shape_MajorAxisLength	1.488e-01
original_shape_Maximum2DDiameterColumn	1.475e-01
original_shape_Maximum2DDiameterRow	1.314e-01
original_shape_Maximum2DDiameterSlice	1.386e-01
original_shape_Maximum3DDiameter	1.418e-01
original_shape_MeshVolume	9.699e-02
original_shape_MinorAxisLength	1.446e-01
original_shape_Sphericity	1.867e-01
original_shape_SurfaceArea	1.105e-01
original_shape_SurfaceVolumeRatio	1.549e-01
original_shape_VoxelVolume	9.717e-02
cluster_tree2.298741	3.728e-01
z	
original_firstorder_10Percentile	166.054
original_firstorder_90Percentile	268.375
original_firstorder_Energy	12.344
original_firstorder_Entropy	-342.256
original_firstorder_InterquartileRange	-336.380
original_firstorder_Kurtosis	21.073
original_firstorder_Maximum	-6.513
original_firstorder_Mean	-323.368
original_firstorder_MeanAbsoluteDeviation	-198.037
original_firstorder_Median	-56.936
original_firstorder_Minimum	658.961
original_firstorder_Range	0.000
original_firstorder_RobustMeanAbsoluteDeviation	217.056
original_firstorder_RootMeanSquared	74.393
original_firstorder_Skewness	-11.980
original_firstorder_TotalEnergy	0.000
original_firstorder_Uniformity	-491.234
original_firstorder_Variance	16020.164
original_glcmm_Autocorrelation	-4584.355
original_glcmm_ClusterProminence	-386.883
original_glcmm_ClusterShade	354.032
original_glcmm_ClusterTendency	362.465
original_glcmm_Contrast	681.520
original_glcmm_Correlation	-80.416
original_glcmm_DifferenceAverage	-2638.443
original_glcmm_DifferenceEntropy	-221.120
original_glcmm_DifferenceVariance	-24.334
original_glcmm_Id	-19297.316

original_glcm_Idm	16286.416
original_glcm_Idmn	-76.667
original_glcm_Idn	123.234
original_glcm_Imc1	156.881
original_glcm_Imc2	158.004
original_glcm_InverseVariance	-1715.286
original_glcm_JointAverage	734.974
original_glcm_JointEnergy	109.180
original_glcm_JointEntropy	648.727
original_glcm_MCC	-23.828
original_glcm_MaximumProbability	33.504
original_glcm_SumAverage	0.000
original_glcm_SumEntropy	-377.150
original_glcm_SumSquares	0.000
original_gldm_DependenceEntropy	-454.051
original_gldm_DependenceNonUniformity	5.386
original_gldm_DependenceNonUniformityNormalized	161.131
original_gldm_DependenceVariance	-327.839
original_gldm_GrayLevelNonUniformity	-37.705
original_gldm_GrayLevelVariance	-14828.711
original_gldm_HighGrayLevelEmphasis	10106.873
original_gldm_LargeDependenceEmphasis	694.880
original_gldm_LargeDependenceHighGrayLevelEmphasis	464.761
original_gldm_LargeDependenceLowGrayLevelEmphasis	-637.389
original_gldm_LowGrayLevelEmphasis	-908.617
original_gldm_SmallDependenceEmphasis	705.346
original_gldm_SmallDependenceHighGrayLevelEmphasis	-171.532
original_gldm_SmallDependenceLowGrayLevelEmphasis	540.999
original_glrlm_GrayLevelNonUniformity	198.136
original_glrlm_GrayLevelNonUniformityNormalized	88.894
original_glrlm_GrayLevelVariance	-613.435
original_glrlm_HighGrayLevelRunEmphasis	-7277.355
original_glrlm_LongRunEmphasis	581.933
original_glrlm_LongRunHighGrayLevelEmphasis	92.000
original_glrlm_LongRunLowGrayLevelEmphasis	100.916
original_glrlm_LowGrayLevelRunEmphasis	10241.942
original_glrlm_RunEntropy	564.351
original_glrlm_RunLengthNonUniformity	136.687
original_glrlm_RunLengthNonUniformityNormalized	-2135.772
original_glrlm_RunPercentage	117.763
original_glrlm_RunVariance	-796.389
original_glrlm_ShortRunEmphasis	1739.704
original_glrlm_ShortRunHighGrayLevelEmphasis	1614.404
original_glrlm_ShortRunLowGrayLevelEmphasis	-9067.650
original_glszm_GrayLevelNonUniformity	-65.851
original_glszm_GrayLevelNonUniformityNormalized	89.327
original_glszm_GrayLevelVariance	4.316
original_glszm_HighGrayLevelZoneEmphasis	-609.491
original_glszm_LargeAreaEmphasis	-15469.993
original_glszm_LargeAreaHighGrayLevelEmphasis	37.446
original_glszm_LargeAreaLowGrayLevelEmphasis	117.311
original_glszm_LowGrayLevelZoneEmphasis	-354.247
original_glszm_SizeZoneNonUniformity	25.046
original_glszm_SizeZoneNonUniformityNormalized	-51.432
original_glszm_SmallAreaEmphasis	-169.340
original_glszm_SmallAreaHighGrayLevelEmphasis	544.863
original_glszm_SmallAreaLowGrayLevelEmphasis	33.069
original_glszm_ZoneEntropy	-74.087
original_glszm_ZonePercentage	-950.161



original_glszm_ZoneVariance	15481.558
original_ngtdm_Busyness	-92.327
original_ngtdm_Coarseness	-87.973
original_ngtdm_Complexity	-67.601
original_ngtdm_Contrast	-89.355
original_ngtdm_Strength	45.436
original_shape_Elongation	-3.760
original_shape_Flatness	12.490
original_shape_LeastAxisLength	31.303
original_shape_MajorAxisLength	8.203
original_shape_Maximum2DDiameterColumn	-39.908
original_shape_Maximum2DDiameterRow	46.912
original_shape_Maximum2DDiameterSlice	-0.990
original_shape_Maximum3DDiameter	105.003
original_shape_MeshVolume	24339.722
original_shape_MinorAxisLength	80.641
original_shape_Sphericity	30.354
original_shape_SurfaceArea	155.082
original_shape_SurfaceVolumeRatio	747.283
original_shape_VoxelVolume	-24739.312
cluster_tree2.298741	42.956

p

original_firstorder_10Percentile	< 2e-16
original_firstorder_90Percentile	< 2e-16
original_firstorder_Energy	< 2e-16
original_firstorder_Entropy	< 2e-16
original_firstorder_InterquartileRange	< 2e-16
original_firstorder_Kurtosis	< 2e-16
original_firstorder_Maximum	7.35e-11
original_firstorder_Mean	< 2e-16
original_firstorder_MeanAbsoluteDeviation	< 2e-16
original_firstorder_Median	< 2e-16
original_firstorder_Minimum	< 2e-16
original_firstorder_Range	1.00000
original_firstorder_RobustMeanAbsoluteDeviation	< 2e-16
original_firstorder_RootMeanSquared	< 2e-16
original_firstorder_Skewness	< 2e-16
original_firstorder_TotalEnergy	1.00000
original_firstorder_Uniformity	< 2e-16
original_firstorder_Variance	< 2e-16
original_glcmm_Autocorrelation	< 2e-16
original_glcmm_ClusterProminence	< 2e-16
original_glcmm_ClusterShade	< 2e-16
original_glcmm_ClusterTendency	< 2e-16
original_glcmm_Contrast	< 2e-16
original_glcmm_Correlation	< 2e-16
original_glcmm_DifferenceAverage	< 2e-16
original_glcmm_DifferenceEntropy	< 2e-16
original_glcmm_DifferenceVariance	< 2e-16
original_glcmm_Id	< 2e-16
original_glcmm_Idm	< 2e-16
original_glcmm_Idmn	< 2e-16
original_glcmm_Idn	< 2e-16
original_glcmm_Imc1	< 2e-16
original_glcmm_Imc2	< 2e-16
original_glcmm_InverseVariance	< 2e-16
original_glcmm_JointAverage	< 2e-16
original_glcmm_JointEnergy	< 2e-16
original_glcmm_JointEntropy	< 2e-16

original_glcm_MCC	< 2e-16
original_glcm_MaximumProbability	< 2e-16
original_glcm_SumAverage	1.00000
original_glcm_SumEntropy	< 2e-16
original_glcm_SumSquares	1.00000
original_gldm_DependenceEntropy	< 2e-16
original_gldm_DependenceNonUniformity	7.22e-08
original_gldm_DependenceNonUniformityNormalized	< 2e-16
original_gldm_DependenceVariance	< 2e-16
original_gldm_GrayLevelNonUniformity	< 2e-16
original_gldm_GrayLevelVariance	< 2e-16
original_gldm_HighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceEmphasis	< 2e-16
original_gldm_LargeDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceLowGrayLevelEmphasis	< 2e-16
original_gldm_LowGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceEmphasis	< 2e-16
original_gldm_SmallDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceLowGrayLevelEmphasis	< 2e-16
original_glrlm_GrayLevelNonUniformity	< 2e-16
original_glrlm_GrayLevelNonUniformityNormalized	< 2e-16
original_glrlm_GrayLevelVariance	< 2e-16
original_glrlm_HighGrayLevelRunEmphasis	< 2e-16
original_glrlm_LongRunEmphasis	< 2e-16
original_glrlm_LongRunHighGrayLevelEmphasis	< 2e-16
original_glrlm_LongRunLowGrayLevelEmphasis	< 2e-16
original_glrlm_LowGrayLevelRunEmphasis	< 2e-16
original_glrlm_RunEntropy	< 2e-16
original_glrlm_RunLengthNonUniformity	< 2e-16
original_glrlm_RunLengthNonUniformityNormalized	< 2e-16
original_glrlm_RunPercentage	< 2e-16
original_glrlm_RunVariance	< 2e-16
original_glrlm_ShortRunEmphasis	< 2e-16
original_glrlm_ShortRunHighGrayLevelEmphasis	< 2e-16
original_glrlm_ShortRunLowGrayLevelEmphasis	< 2e-16
original_glszm_GrayLevelNonUniformity	< 2e-16
original_glszm_GrayLevelNonUniformityNormalized	< 2e-16
original_glszm_GrayLevelVariance	1.59e-05
original_glszm_HighGrayLevelZoneEmphasis	< 2e-16
original_glszm_LargeAreaEmphasis	< 2e-16
original_glszm_LargeAreaHighGrayLevelEmphasis	< 2e-16
original_glszm_LargeAreaLowGrayLevelEmphasis	< 2e-16
original_glszm_LowGrayLevelZoneEmphasis	< 2e-16
original_glszm_SizeZoneNonUniformity	< 2e-16
original_glszm_SizeZoneNonUniformityNormalized	< 2e-16
original_glszm_SmallAreaEmphasis	< 2e-16
original_glszm_SmallAreaHighGrayLevelEmphasis	< 2e-16
original_glszm_SmallAreaLowGrayLevelEmphasis	< 2e-16
original_glszm_ZoneEntropy	< 2e-16
original_glszm_ZonePercentage	< 2e-16
original_glszm_ZoneVariance	< 2e-16
original_ngtdm_Busyness	< 2e-16
original_ngtdm_Coarseness	< 2e-16
original_ngtdm_Complexity	< 2e-16
original_ngtdm_Contrast	< 2e-16
original_ngtdm_Strength	< 2e-16
original_shape_Elongation	0.00017
original_shape_Flatness	< 2e-16
original_shape_LeastAxisLength	< 2e-16

```

original_shape_MajorAxisLength      2.34e-16
original_shape_Maximum2DDiameterColumn < 2e-16
original_shape_Maximum2DDiameterRow  < 2e-16
original_shape_Maximum2DDiameterSlice 0.32221
original_shape_Maximum3DDiameter     < 2e-16
original_shape_MeshVolume            < 2e-16
original_shape_MinorAxisLength       < 2e-16
original_shape_Sphericity            < 2e-16
original_shape_SurfaceArea           < 2e-16
original_shape_SurfaceVolumeRatio    < 2e-16
original_shape_VoxelVolume           < 2e-16
cluster_tree2.298741                 < 2e-16

```

```

Likelihood ratio test=297.7 on 108 df, p=< 2.2e-16
n= 360, number of events= 41

```

```

$model_list[[4]]$clusters
[1] 2.298741 0.378275

```

```

$model_list[[5]]
$model_list[[5]]$treemodel
n= 361

```

```

node), split, n, deviance, yval
    * denotes terminal node

```

```

1) root 361 276.13440 1.0000000
  2) original_firstorder_Maximum< 0.642026 309 183.90000 0.7107905 *
  3) original_firstorder_Maximum>=0.642026 52 71.99402 2.7968030 *

```

```

$model_list[[5]]$modcoxmodel

```

```

Call:

```

```

coxph(formula = as.formula(paste("Surv(df_train$time, df_train$event) ~",
  paste(predict.factors, collapse = "+"))), data = df_train,
  x = TRUE)

```

```

                                coef
original_firstorder_10Percentile 6.322e+01
original_firstorder_90Percentile 6.884e+01
original_firstorder_Energy       -3.412e+01
original_firstorder_Entropy      -8.034e+01
original_firstorder_InterquartileRange -3.979e+01
original_firstorder_Kurtosis      2.634e+00
original_firstorder_Maximum      -5.124e+00
original_firstorder_Mean         -3.032e+02
original_firstorder_MeanAbsoluteDeviation -1.298e+02
original_firstorder_Median       1.501e+02
original_firstorder_Minimum      7.215e+01
original_firstorder_Range        0.000e+00
original_firstorder_RobustMeanAbsoluteDeviation 8.426e+01
original_firstorder_RootMeanSquared 2.863e+01
original_firstorder_Skewness     2.074e+00
original_firstorder_TotalEnergy   0.000e+00
original_firstorder_Uniformity   -3.348e+01
original_firstorder_Variance     8.859e+03
original_glm_Autocorrelation     1.676e+02
original_glm_ClusterProminence   1.967e+03
original_glm_ClusterShade       4.137e+02

```

original_glcm_ClusterTendency	4.225e+01
original_glcm_Contrast	2.141e+03
original_glcm_Correlation	-1.618e+01
original_glcm_DifferenceAverage	6.868e+01
original_glcm_DifferenceEntropy	1.068e+02
original_glcm_DifferenceVariance	-2.440e+03
original_glcm_Id	2.007e+03
original_glcm_Idm	-1.775e+03
original_glcm_Idmn	-4.009e+01
original_glcm_Idn	3.477e+01
original_glcm_Imc1	-3.800e+01
original_glcm_Imc2	-3.272e+01
original_glcm_InverseVariance	1.821e+02
original_glcm_JointAverage	2.667e+01
original_glcm_JointEnergy	-1.777e+01
original_glcm_JointEntropy	-8.015e+01
original_glcm_MCC	7.405e+00
original_glcm_MaximumProbability	2.333e+01
original_glcm_SumAverage	0.000e+00
original_glcm_SumEntropy	3.343e+01
original_glcm_SumSquares	0.000e+00
original_gldm_DependenceEntropy	5.368e+01
original_gldm_DependenceNonUniformity	1.297e+00
original_gldm_DependenceNonUniformityNormalized	5.798e+01
original_gldm_DependenceVariance	-2.094e+01
original_gldm_GrayLevelNonUniformity	2.008e+01
original_gldm_GrayLevelVariance	-9.153e+03
original_gldm_HighGrayLevelEmphasis	-4.651e+02
original_gldm_LargeDependenceEmphasis	1.099e+02
original_gldm_LargeDependenceHighGrayLevelEmphasis	6.853e+01
original_gldm_LargeDependenceLowGrayLevelEmphasis	-2.356e+01
original_gldm_LowGrayLevelEmphasis	-1.587e+02
original_gldm_SmallDependenceEmphasis	-4.191e+01
original_gldm_SmallDependenceHighGrayLevelEmphasis	5.246e+00
original_gldm_SmallDependenceLowGrayLevelEmphasis	-1.025e+01
original_glrlm_GrayLevelNonUniformity	1.898e+01
original_glrlm_GrayLevelNonUniformityNormalized	2.840e+01
original_glrlm_GrayLevelVariance	1.508e+02
original_glrlm_HighGrayLevelRunEmphasis	1.571e+02
original_glrlm_LongRunEmphasis	-6.435e+01
original_glrlm_LongRunHighGrayLevelEmphasis	-2.627e+01
original_glrlm_LongRunLowGrayLevelEmphasis	-2.723e+01
original_glrlm_LowGrayLevelRunEmphasis	3.349e+02
original_glrlm_RunEntropy	9.480e+01
original_glrlm_RunLengthNonUniformity	9.653e+01
original_glrlm_RunLengthNonUniformityNormalized	-6.732e+01
original_glrlm_RunPercentage	1.877e+02
original_glrlm_RunVariance	4.704e+01
original_glrlm_ShortRunEmphasis	-1.722e+01
original_glrlm_ShortRunHighGrayLevelEmphasis	1.810e+02
original_glrlm_ShortRunLowGrayLevelEmphasis	-1.237e+02
original_glszm_GrayLevelNonUniformity	-2.950e+00
original_glszm_GrayLevelNonUniformityNormalized	2.535e+01
original_glszm_GrayLevelVariance	2.131e+01
original_glszm_HighGrayLevelZoneEmphasis	1.283e+01
original_glszm_LargeAreaEmphasis	-3.400e+01
original_glszm_LargeAreaHighGrayLevelEmphasis	6.183e-01
original_glszm_LargeAreaLowGrayLevelEmphasis	-3.366e+01
original_glszm_LowGrayLevelZoneEmphasis	-3.697e+01

original_glszm_SizeZoneNonUniformity	1.516e+01
original_glszm_SizeZoneNonUniformityNormalized	-3.533e+01
original_glszm_SmallAreaEmphasis	4.830e+01
original_glszm_SmallAreaHighGrayLevelEmphasis	-3.783e+01
original_glszm_SmallAreaLowGrayLevelEmphasis	1.896e+01
original_glszm_ZoneEntropy	1.690e+01
original_glszm_ZonePercentage	2.247e+00
original_glszm_ZoneVariance	5.110e+01
original_ngtdm_Busyness	7.453e+00
original_ngtdm_Coarseness	-2.686e+00
original_ngtdm_Complexity	-5.706e+00
original_ngtdm_Contrast	3.480e+01
original_ngtdm_Strength	-2.518e+01
original_shape_Elongation	2.060e+01
original_shape_Flatness	-1.766e+01
original_shape_LeastAxisLength	2.723e+01
original_shape_MajorAxisLength	2.472e+01
original_shape_Maximum2DDiameterColumn	-6.372e+00
original_shape_Maximum2DDiameterRow	-3.562e+00
original_shape_Maximum2DDiameterSlice	-1.349e+01
original_shape_Maximum3DDiameter	6.049e+00
original_shape_MeshVolume	3.103e+03
original_shape_MinorAxisLength	-1.773e+01
original_shape_Sphericity	-6.768e-01
original_shape_SurfaceArea	-4.043e+01
original_shape_SurfaceVolumeRatio	7.871e+01
original_shape_VoxelVolume	-3.212e+03
cluster_tree2.796803	1.771e+01
	exp(coef)
original_firstorder_10Percentile	2.852e+27
original_firstorder_90Percentile	7.886e+29
original_firstorder_Energy	1.523e-15
original_firstorder_Entropy	1.285e-35
original_firstorder_InterquartileRange	5.239e-18
original_firstorder_Kurtosis	1.393e+01
original_firstorder_Maximum	5.953e-03
original_firstorder_Mean	2.015e-132
original_firstorder_MeanAbsoluteDeviation	4.365e-57
original_firstorder_Median	1.537e+65
original_firstorder_Minimum	2.163e+31
original_firstorder_Range	1.000e+00
original_firstorder_RobustMeanAbsoluteDeviation	3.925e+36
original_firstorder_RootMeanSquared	2.714e+12
original_firstorder_Skewness	7.959e+00
original_firstorder_TotalEnergy	1.000e+00
original_firstorder_Uniformity	2.874e-15
original_firstorder_Variance	Inf
original_glcmm_Autocorrelation	6.076e+72
original_glcmm_ClusterProminence	Inf
original_glcmm_ClusterShade	4.545e+179
original_glcmm_ClusterTendency	2.223e+18
original_glcmm_Contrast	Inf
original_glcmm_Correlation	9.387e-08
original_glcmm_DifferenceAverage	6.724e+29
original_glcmm_DifferenceEntropy	2.347e+46
original_glcmm_DifferenceVariance	0.000e+00
original_glcmm_Id	Inf
original_glcmm_Idm	0.000e+00
original_glcmm_Idmn	3.874e-18

original_glcm_Idn	1.265e+15
original_glcm_Imc1	3.148e-17
original_glcm_Imc2	6.168e-15
original_glcm_InverseVariance	1.260e+79
original_glcm_JointAverage	3.819e+11
original_glcm_JointEnergy	1.925e-08
original_glcm_JointEntropy	1.549e-35
original_glcm_MCC	1.645e+03
original_glcm_MaximumProbability	1.351e+10
original_glcm_SumAverage	1.000e+00
original_glcm_SumEntropy	3.297e+14
original_glcm_SumSquares	1.000e+00
original_gldm_DependenceEntropy	2.057e+23
original_gldm_DependenceNonUniformity	3.659e+00
original_gldm_DependenceNonUniformityNormalized	1.515e+25
original_gldm_DependenceVariance	8.077e-10
original_gldm_GrayLevelNonUniformity	5.249e+08
original_gldm_GrayLevelVariance	0.000e+00
original_gldm_HighGrayLevelEmphasis	1.003e-202
original_gldm_LargeDependenceEmphasis	5.225e+47
original_gldm_LargeDependenceHighGrayLevelEmphasis	5.779e+29
original_gldm_LargeDependenceLowGrayLevelEmphasis	5.836e-11
original_gldm_LowGrayLevelEmphasis	1.158e-69
original_gldm_SmallDependenceEmphasis	6.293e-19
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.898e+02
original_gldm_SmallDependenceLowGrayLevelEmphasis	3.531e-05
original_glrlm_GrayLevelNonUniformity	1.748e+08
original_glrlm_GrayLevelNonUniformityNormalized	2.164e+12
original_glrlm_GrayLevelVariance	3.143e+65
original_glrlm_HighGrayLevelRunEmphasis	1.656e+68
original_glrlm_LongRunEmphasis	1.130e-28
original_glrlm_LongRunHighGrayLevelEmphasis	3.899e-12
original_glrlm_LongRunLowGrayLevelEmphasis	1.488e-12
original_glrlm_LowGrayLevelRunEmphasis	2.688e+145
original_glrlm_RunEntropy	1.486e+41
original_glrlm_RunLengthNonUniformity	8.405e+41
original_glrlm_RunLengthNonUniformityNormalized	5.794e-30
original_glrlm_RunPercentage	3.314e+81
original_glrlm_RunVariance	2.694e+20
original_glrlm_ShortRunEmphasis	3.334e-08
original_glrlm_ShortRunHighGrayLevelEmphasis	4.100e+78
original_glrlm_ShortRunLowGrayLevelEmphasis	1.918e-54
original_glszm_GrayLevelNonUniformity	5.236e-02
original_glszm_GrayLevelNonUniformityNormalized	1.020e+11
original_glszm_GrayLevelVariance	1.801e+09
original_glszm_HighGrayLevelZoneEmphasis	3.734e+05
original_glszm_LargeAreaEmphasis	1.720e-15
original_glszm_LargeAreaHighGrayLevelEmphasis	1.856e+00
original_glszm_LargeAreaLowGrayLevelEmphasis	2.407e-15
original_glszm_LowGrayLevelZoneEmphasis	8.817e-17
original_glszm_SizeZoneNonUniformity	3.823e+06
original_glszm_SizeZoneNonUniformityNormalized	4.527e-16
original_glszm_SmallAreaEmphasis	9.519e+20
original_glszm_SmallAreaHighGrayLevelEmphasis	3.737e-17
original_glszm_SmallAreaLowGrayLevelEmphasis	1.711e+08
original_glszm_ZoneEntropy	2.184e+07
original_glszm_ZonePercentage	9.455e+00
original_glszm_ZoneVariance	1.556e+22
original_ngtdm_Busyness	1.725e+03

original_ngtdm_Coarseness	6.813e-02
original_ngtdm_Complexity	3.325e-03
original_ngtdm_Contrast	1.295e+15
original_ngtdm_Strength	1.157e-11
original_shape_Elongation	8.836e+08
original_shape_Flatness	2.145e-08
original_shape_LeastAxisLength	6.712e+11
original_shape_MajorAxisLength	5.415e+10
original_shape_Maximum2DDiameterColumn	1.708e-03
original_shape_Maximum2DDiameterRow	2.838e-02
original_shape_Maximum2DDiameterSlice	1.382e-06
original_shape_Maximum3DDiameter	4.238e+02
original_shape_MeshVolume	Inf
original_shape_MinorAxisLength	1.996e-08
original_shape_Sphericity	5.083e-01
original_shape_SurfaceArea	2.764e-18
original_shape_SurfaceVolumeRatio	1.531e+34
original_shape_VoxelVolume	0.000e+00
cluster_tree2.796803	4.925e+07
	se(coef)
original_firstorder_10Percentile	3.163e-01
original_firstorder_90Percentile	8.797e-02
original_firstorder_Energy	1.721e-01
original_firstorder_Entropy	1.285e-01
original_firstorder_InterquartileRange	1.403e-01
original_firstorder_Kurtosis	1.287e-01
original_firstorder_Maximum	1.390e-01
original_firstorder_Mean	1.680e-01
original_firstorder_MeanAbsoluteDeviation	1.707e-01
original_firstorder_Median	1.458e-01
original_firstorder_Minimum	1.518e-01
original_firstorder_Range	1.475e-01
original_firstorder_RobustMeanAbsoluteDeviation	1.483e-01
original_firstorder_RootMeanSquared	1.676e-01
original_firstorder_Skewness	1.147e-01
original_firstorder_TotalEnergy	1.721e-01
original_firstorder_Uniformity	1.210e-01
original_firstorder_Variance	3.682e-01
original_glcmm_Autocorrelation	1.455e-01
original_glcmm_ClusterProminence	6.212e+00
original_glcmm_ClusterShade	1.071e+00
original_glcmm_ClusterTendency	3.742e-01
original_glcmm_Contrast	8.247e-01
original_glcmm_Correlation	1.508e-01
original_glcmm_DifferenceAverage	1.463e-01
original_glcmm_DifferenceEntropy	1.305e-01
original_glcmm_DifferenceVariance	1.096e+00
original_glcmm_Id	1.187e-01
original_glcmm_Idm	1.194e-01
original_glcmm_Idmn	1.647e-01
original_glcmm_Idn	1.363e-01
original_glcmm_Imc1	1.361e-01
original_glcmm_Imc2	1.670e-01
original_glcmm_InverseVariance	1.129e-01
original_glcmm_JointAverage	1.450e-01
original_glcmm_JointEnergy	1.058e-01
original_glcmm_JointEntropy	1.221e-01
original_glcmm_MCC	1.766e-01
original_glcmm_MaximumProbability	1.194e-01

original_glcm_SumAverage	1.450e-01
original_glcm_SumEntropy	1.273e-01
original_glcm_SumSquares	4.235e-01
original_gldm_DependenceEntropy	1.126e-01
original_gldm_DependenceNonUniformity	8.406e-02
original_gldm_DependenceNonUniformityNormalized	9.531e-02
original_gldm_DependenceVariance	1.468e-01
original_gldm_GrayLevelNonUniformity	9.809e-02
original_gldm_GrayLevelVariance	3.680e-01
original_gldm_HighGrayLevelEmphasis	1.457e-01
original_gldm_LargeDependenceEmphasis	1.542e-01
original_gldm_LargeDependenceHighGrayLevelEmphasis	1.298e-01
original_gldm_LargeDependenceLowGrayLevelEmphasis	4.088e-01
original_gldm_LowGrayLevelEmphasis	1.139e-01
original_gldm_SmallDependenceEmphasis	1.490e-01
original_gldm_SmallDependenceHighGrayLevelEmphasis	1.336e-01
original_gldm_SmallDependenceLowGrayLevelEmphasis	1.150e-01
original_glrlm_GrayLevelNonUniformity	8.923e-02
original_glrlm_GrayLevelNonUniformityNormalized	1.178e-01
original_glrlm_GrayLevelVariance	3.313e-01
original_glrlm_HighGrayLevelRunEmphasis	1.455e-01
original_glrlm_LongRunEmphasis	8.414e-02
original_glrlm_LongRunHighGrayLevelEmphasis	1.062e-01
original_glrlm_LongRunLowGrayLevelEmphasis	2.612e-01
original_glrlm_LowGrayLevelRunEmphasis	1.155e-01
original_glrlm_RunEntropy	1.270e-01
original_glrlm_RunLengthNonUniformity	1.003e-01
original_glrlm_RunLengthNonUniformityNormalized	1.451e-01
original_glrlm_RunPercentage	1.497e-01
original_glrlm_RunVariance	7.836e-02
original_glrlm_ShortRunEmphasis	1.499e-01
original_glrlm_ShortRunHighGrayLevelEmphasis	1.472e-01
original_glrlm_ShortRunLowGrayLevelEmphasis	1.029e-01
original_glszm_GrayLevelNonUniformity	1.041e-01
original_glszm_GrayLevelNonUniformityNormalized	1.588e-01
original_glszm_GrayLevelVariance	1.949e-01
original_glszm_HighGrayLevelZoneEmphasis	1.492e-01
original_glszm_LargeAreaEmphasis	1.093e-01
original_glszm_LargeAreaHighGrayLevelEmphasis	8.947e-02
original_glszm_LargeAreaLowGrayLevelEmphasis	4.566e-01
original_glszm_LowGrayLevelZoneEmphasis	1.565e-01
original_glszm_SizeZoneNonUniformity	1.172e-01
original_glszm_SizeZoneNonUniformityNormalized	1.400e-01
original_glszm_SmallAreaEmphasis	1.296e-01
original_glszm_SmallAreaHighGrayLevelEmphasis	1.510e-01
original_glszm_SmallAreaLowGrayLevelEmphasis	1.793e-01
original_glszm_ZoneEntropy	1.556e-01
original_glszm_ZonePercentage	1.469e-01
original_glszm_ZoneVariance	1.092e-01
original_ngtdm_Busyness	3.332e-01
original_ngtdm_Coarseness	9.703e-02
original_ngtdm_Complexity	1.944e-01
original_ngtdm_Contrast	4.851e-01
original_ngtdm_Strength	2.870e-01
original_shape_Elongation	1.456e-01
original_shape_Flatness	1.510e-01
original_shape_LeastAxisLength	1.201e-01
original_shape_MajorAxisLength	1.196e-01
original_shape_Maximum2DDiameterColumn	1.164e-01



original_shape_Maximum2DDiameterRow	1.231e-01
original_shape_Maximum2DDiameterSlice	1.248e-01
original_shape_Maximum3DDiameter	1.119e-01
original_shape_MeshVolume	9.747e-02
original_shape_MinorAxisLength	1.214e-01
original_shape_Sphericity	1.584e-01
original_shape_SurfaceArea	1.008e-01
original_shape_SurfaceVolumeRatio	1.378e-01
original_shape_VoxelVolume	9.756e-02
cluster_tree2.796803	3.256e-01
z	
original_firstorder_10Percentile	199.841
original_firstorder_90Percentile	782.507
original_firstorder_Energy	-198.302
original_firstorder_Entropy	-625.307
original_firstorder_InterquartileRange	-283.564
original_firstorder_Kurtosis	20.472
original_firstorder_Maximum	-36.869
original_firstorder_Mean	-1805.212
original_firstorder_MeanAbsoluteDeviation	-760.314
original_firstorder_Median	1029.547
original_firstorder_Minimum	475.457
original_firstorder_Range	0.000
original_firstorder_RobustMeanAbsoluteDeviation	568.044
original_firstorder_RootMeanSquared	170.793
original_firstorder_Skewness	18.078
original_firstorder_TotalEnergy	0.000
original_firstorder_Uniformity	-276.693
original_firstorder_Variance	24058.628
original_glcmm_Autocorrelation	1151.969
original_glcmm_ClusterProminence	316.585
original_glcmm_ClusterShade	386.118
original_glcmm_ClusterTendency	112.909
original_glcmm_Contrast	2596.451
original_glcmm_Correlation	-107.278
original_glcmm_DifferenceAverage	469.301
original_glcmm_DifferenceEntropy	817.894
original_glcmm_DifferenceVariance	-2225.689
original_glcmm_Id	16909.404
original_glcmm_Idm	-14867.940
original_glcmm_Idmn	-243.479
original_glcmm_Idn	255.133
original_glcmm_Imc1	-279.100
original_glcmm_Imc2	-195.880
original_glcmm_InverseVariance	1612.585
original_glcmm_JointAverage	183.973
original_glcmm_JointEnergy	-167.983
original_glcmm_JointEntropy	-656.251
original_glcmm_MCC	41.940
original_glcmm_MaximumProbability	195.334
original_glcmm_SumAverage	0.000
original_glcmm_SumEntropy	262.621
original_glcmm_SumSquares	0.000
original_gldm_DependenceEntropy	476.589
original_gldm_DependenceNonUniformity	15.433
original_gldm_DependenceNonUniformityNormalized	608.341
original_gldm_DependenceVariance	-142.655
original_gldm_GrayLevelNonUniformity	204.690
original_gldm_GrayLevelVariance	-24873.481

original_gldm_HighGrayLevelEmphasis	-3191.214
original_gldm_LargeDependenceEmphasis	712.488
original_gldm_LargeDependenceHighGrayLevelEmphasis	527.937
original_gldm_LargeDependenceLowGrayLevelEmphasis	-57.644
original_gldm_LowGrayLevelEmphasis	-1393.013
original_gldm_SmallDependenceEmphasis	-281.357
original_gldm_SmallDependenceHighGrayLevelEmphasis	39.255
original_gldm_SmallDependenceLowGrayLevelEmphasis	-89.115
original_glrlm_GrayLevelNonUniformity	212.690
original_glrlm_GrayLevelNonUniformityNormalized	241.059
original_glrlm_GrayLevelVariance	455.160
original_glrlm_HighGrayLevelRunEmphasis	1079.650
original_glrlm_LongRunEmphasis	-764.823
original_glrlm_LongRunHighGrayLevelEmphasis	-247.385
original_glrlm_LongRunLowGrayLevelEmphasis	-104.245
original_glrlm_LowGrayLevelRunEmphasis	2898.994
original_glrlm_RunEntropy	746.181
original_glrlm_RunLengthNonUniformity	962.780
original_glrlm_RunLengthNonUniformityNormalized	-464.045
original_glrlm_RunPercentage	1253.692
original_glrlm_RunVariance	600.347
original_glrlm_ShortRunEmphasis	-114.889
original_glrlm_ShortRunHighGrayLevelEmphasis	1229.856
original_glrlm_ShortRunLowGrayLevelEmphasis	-1201.475
original_glszm_GrayLevelNonUniformity	-28.347
original_glszm_GrayLevelNonUniformityNormalized	159.586
original_glszm_GrayLevelVariance	109.361
original_glszm_HighGrayLevelZoneEmphasis	86.003
original_glszm_LargeAreaEmphasis	-310.994
original_glszm_LargeAreaHighGrayLevelEmphasis	6.911
original_glszm_LargeAreaLowGrayLevelEmphasis	-73.725
original_glszm_LowGrayLevelZoneEmphasis	-236.236
original_glszm_SizeZoneNonUniformity	129.354
original_glszm_SizeZoneNonUniformityNormalized	-252.450
original_glszm_SmallAreaEmphasis	372.618
original_glszm_SmallAreaHighGrayLevelEmphasis	-250.537
original_glszm_SmallAreaLowGrayLevelEmphasis	105.754
original_glszm_ZoneEntropy	108.622
original_glszm_ZonePercentage	15.298
original_glszm_ZoneVariance	468.096
original_ngtdm_Busyness	22.370
original_ngtdm_Coarseness	-27.685
original_ngtdm_Complexity	-29.349
original_ngtdm_Contrast	71.730
original_ngtdm_Strength	-87.738
original_shape_Elongation	141.438
original_shape_Flatness	-116.965
original_shape_LeastAxisLength	226.720
original_shape_MajorAxisLength	206.690
original_shape_Maximum2DDiameterColumn	-54.761
original_shape_Maximum2DDiameterRow	-28.931
original_shape_Maximum2DDiameterSlice	-108.069
original_shape_Maximum3DDiameter	54.041
original_shape_MeshVolume	31835.199
original_shape_MinorAxisLength	-146.020
original_shape_Sphericity	-4.272
original_shape_SurfaceArea	-401.184
original_shape_SurfaceVolumeRatio	571.074
original_shape_VoxelVolume	-32922.444

cluster_tree2.796803	54.402
	p
original_firstorder_10Percentile	< 2e-16
original_firstorder_90Percentile	< 2e-16
original_firstorder_Energy	< 2e-16
original_firstorder_Entropy	< 2e-16
original_firstorder_InterquartileRange	< 2e-16
original_firstorder_Kurtosis	< 2e-16
original_firstorder_Maximum	< 2e-16
original_firstorder_Mean	< 2e-16
original_firstorder_MeanAbsoluteDeviation	< 2e-16
original_firstorder_Median	< 2e-16
original_firstorder_Minimum	< 2e-16
original_firstorder_Range	1
original_firstorder_RobustMeanAbsoluteDeviation	< 2e-16
original_firstorder_RootMeanSquared	< 2e-16
original_firstorder_Skewness	< 2e-16
original_firstorder_TotalEnergy	1
original_firstorder_Uniformity	< 2e-16
original_firstorder_Variance	< 2e-16
original_glcmm_Autocorrelation	< 2e-16
original_glcmm_ClusterProminence	< 2e-16
original_glcmm_ClusterShade	< 2e-16
original_glcmm_ClusterTendency	< 2e-16
original_glcmm_Contrast	< 2e-16
original_glcmm_Correlation	< 2e-16
original_glcmm_DifferenceAverage	< 2e-16
original_glcmm_DifferenceEntropy	< 2e-16
original_glcmm_DifferenceVariance	< 2e-16
original_glcmm_Id	< 2e-16
original_glcmm_Idm	< 2e-16
original_glcmm_Idmn	< 2e-16
original_glcmm_Idn	< 2e-16
original_glcmm_Imc1	< 2e-16
original_glcmm_Imc2	< 2e-16
original_glcmm_InverseVariance	< 2e-16
original_glcmm_JointAverage	< 2e-16
original_glcmm_JointEnergy	< 2e-16
original_glcmm_JointEntropy	< 2e-16
original_glcmm_MCC	< 2e-16
original_glcmm_MaximumProbability	< 2e-16
original_glcmm_SumAverage	1
original_glcmm_SumEntropy	< 2e-16
original_glcmm_SumSquares	1
original_gldm_DependenceEntropy	< 2e-16
original_gldm_DependenceNonUniformity	< 2e-16
original_gldm_DependenceNonUniformityNormalized	< 2e-16
original_gldm_DependenceVariance	< 2e-16
original_gldm_GrayLevelNonUniformity	< 2e-16
original_gldm_GrayLevelVariance	< 2e-16
original_gldm_HighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceEmphasis	< 2e-16
original_gldm_LargeDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_LargeDependenceLowGrayLevelEmphasis	< 2e-16
original_gldm_LowGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceEmphasis	< 2e-16
original_gldm_SmallDependenceHighGrayLevelEmphasis	< 2e-16
original_gldm_SmallDependenceLowGrayLevelEmphasis	< 2e-16
original_glrmm_GrayLevelNonUniformity	< 2e-16

```

original_glrlm_GrayLevelNonUniformityNormalized < 2e-16
original_glrlm_GrayLevelVariance < 2e-16
original_glrlm_HighGrayLevelRunEmphasis < 2e-16
original_glrlm_LongRunEmphasis < 2e-16
original_glrlm_LongRunHighGrayLevelEmphasis < 2e-16
original_glrlm_LongRunLowGrayLevelEmphasis < 2e-16
original_glrlm_LowGrayLevelRunEmphasis < 2e-16
original_glrlm_RunEntropy < 2e-16
original_glrlm_RunLengthNonUniformity < 2e-16
original_glrlm_RunLengthNonUniformityNormalized < 2e-16
original_glrlm_RunPercentage < 2e-16
original_glrlm_RunVariance < 2e-16
original_glrlm_ShortRunEmphasis < 2e-16
original_glrlm_ShortRunHighGrayLevelEmphasis < 2e-16
original_glrlm_ShortRunLowGrayLevelEmphasis < 2e-16
original_glszm_GrayLevelNonUniformity < 2e-16
original_glszm_GrayLevelNonUniformityNormalized < 2e-16
original_glszm_GrayLevelVariance < 2e-16
original_glszm_HighGrayLevelZoneEmphasis < 2e-16
original_glszm_LargeAreaEmphasis < 2e-16
original_glszm_LargeAreaHighGrayLevelEmphasis 4.80e-12
original_glszm_LargeAreaLowGrayLevelEmphasis < 2e-16
original_glszm_LowGrayLevelZoneEmphasis < 2e-16
original_glszm_SizeZoneNonUniformity < 2e-16
original_glszm_SizeZoneNonUniformityNormalized < 2e-16
original_glszm_SmallAreaEmphasis < 2e-16
original_glszm_SmallAreaHighGrayLevelEmphasis < 2e-16
original_glszm_SmallAreaLowGrayLevelEmphasis < 2e-16
original_glszm_ZoneEntropy < 2e-16
original_glszm_ZonePercentage < 2e-16
original_glszm_ZoneVariance < 2e-16
original_ngtdm_Busyness < 2e-16
original_ngtdm_Coarseness < 2e-16
original_ngtdm_Complexity < 2e-16
original_ngtdm_Contrast < 2e-16
original_ngtdm_Strength < 2e-16
original_shape_Elongation < 2e-16
original_shape_Flatness < 2e-16
original_shape_LeastAxisLength < 2e-16
original_shape_MajorAxisLength < 2e-16
original_shape_Maximum2DDiameterColumn < 2e-16
original_shape_Maximum2DDiameterRow < 2e-16
original_shape_Maximum2DDiameterSlice < 2e-16
original_shape_Maximum3DDiameter < 2e-16
original_shape_MeshVolume < 2e-16
original_shape_MinorAxisLength < 2e-16
original_shape_Sphericity 1.94e-05
original_shape_SurfaceArea < 2e-16
original_shape_SurfaceVolumeRatio < 2e-16
original_shape_VoxelVolume < 2e-16
cluster_tree2.796803 < 2e-16

```

Likelihood ratio test=271.9 on 108 df, p=4.105e-16

n= 361, number of events= 47

```
$model_list[[5]]$clusters
```

```
[1] 0.710791 2.796803
```

```
$time
```

```
Time difference of 7.570593 secs
```