Machine Learning Assignment 1

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Assignment 1

1 P(Y=1/X) > 0.5

```
## The confusion matrix for training data with logistics regression:
```

```
##
## train_model_pred    0    1
##       not a spam  803   81
##       spam        142  344
```

```
## The misclassification for training data with logistics regression: 0.1627737
```

```
## The confusion matrix for testing data with logistics regression:
```

```
##
## test_model_pred    0    1
##       not a spam  814   81
##       spam        123  352
```

```
## The misclassification for testing data with logistics regression: 0.1489051
```

The model is created using logistic Regression.The training data miscalculation is 16.28% and the testing data miscalculation is 14.90% for the probability 0.5.

P(Y=1/X) > 0.8

```
## The confusion matrix for training data with logistics regression:
```

```
##
## train_model_pred    0    1
##       not a spam  941  335
##       spam          4   90
```

```
## The misclassification for training data with logistics regression: 0.2474453
```

```
## The confusion matrix for testing data with logistics regression:
```

```
##
## test_model_pred    0    1
##       not a spam  929  358
##       spam          8   75
```

The misclassification for testing data with logistics regression: 0.2671533

The model is created using logistic Regression.The training data miscalculation is 24.74% and the testing data miscalculation is 26.71% for the probability 0.8.The accuracy has decreased when the threshold value increased. There is increase in false positive rate(i.e not a spam mail but marked as spam mail) when the threshold value is increased.This should not happened so it is bad to use the threshold value as 0.8.

kknn = 30

```
## The confusion matrix for training data with kknn method:

##
## kknn_predtr   0   1
##           0 807  98
##           1 138 327

## The confusion matrix for testing data with kknn method:

##
## kknn_predte   0   1
##           0 792 106
##           1 145 327

## The misclassification rate for training data with kknn method: 0.1722628

## The misclassification rate for testing data with kknn method: 0.1832117
```

So, the misclassification for training data and test data is 16.71% and 18.90% respectively for k value as 30. Since it has to be compared with previous logistic regression, I took the probability as 0.5. The misclassification is lower in logistic regression than kknn = 30. So logistic regression is better than kknn model with 30.

kknn = 1

```
## The confusion matrix for training data with kknn method:

##
## kknn_pred1tr   0   1
##            0 945   0
##            1   0 425

## The confusion matrix for testing data with kknn method:

##
## kknn_pred1te   0   1
##            0 937   0
##            1   0 433

## The misclassification rate for training data with kknn method: 0

## The misclassification rate for testing data with kknn method: 0
```

The misclassification for training data and test data is one. When k = 1, the number of neighbours to be compared will decrease which leads to increase in accuracy.

Assignment 3

3.1 and 3.2

```
##  [1] 34 41 35 39 20  7 14 21 29 38  2  6 26  1 13 15 33 31 36 27 30  9 25 17 32
## [26] 45 23 11  5 22 46 47  3 10 19 28 24 43 44 37 18 40 12  4 16 42  8
##           Agriculture Examination Education Catholic Infant.Mortality
## Martigwy         78.2          12         6    98.96             19.4
## Le Locle         16.7          22        13    11.22             18.9
## Monthey          64.9           7         3    98.22             20.2
## Boudry           38.4          26        12     5.62             20.3
## Lavaux           73.0          19         9     2.84             20.0
## Broye            70.2          16         7    92.85             23.6
## [1] 70.5 72.7 79.4 70.4 65.1 83.8
```
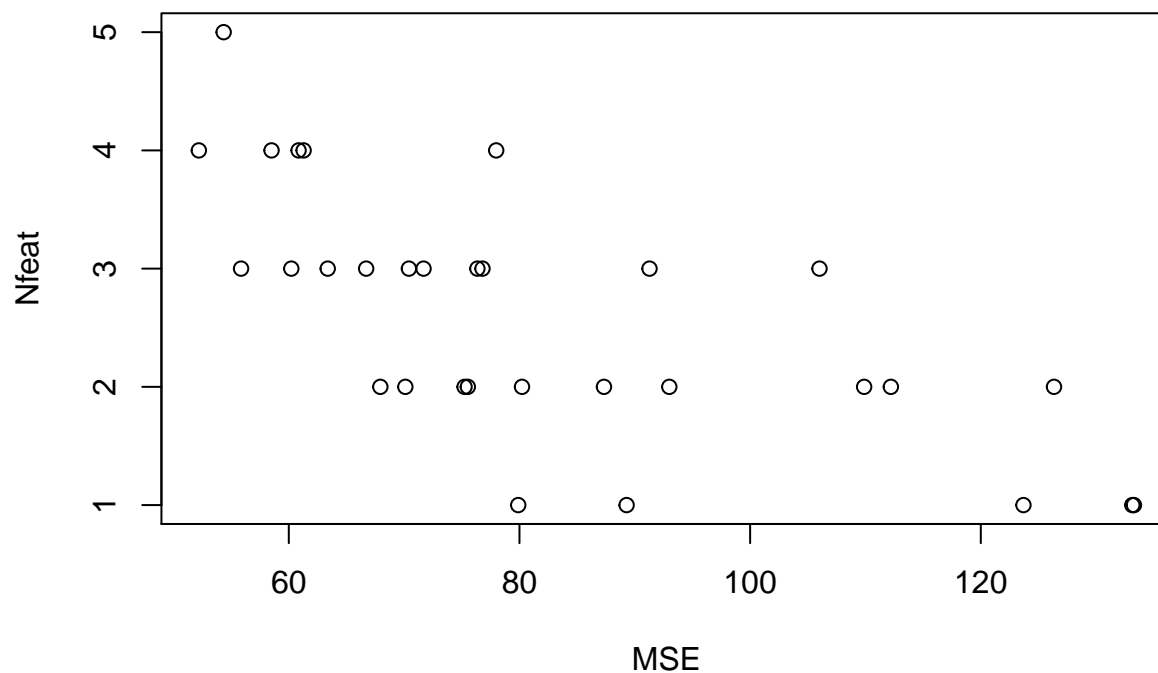


```
## $CV
## [1] 52.19978
##
## $Features
## [1] 1 0 1 1 1
```

The number of parameters which is found to be significant are 49 parameters. The MSE values are less for the models 1 0 1 1 1 (**Agriculture**, **Education**, **Catholic**, **Infant.Mortality**) and the cv score are 68.9 68.3 74.2 60.5 57.4 58.3. From the cv scores, the parameters will have considerable significance over fertility. The graph is plotted between MSE and Number of feature.The beta values are calculated based on

the formula which we refered while forming linear regression. We are adding 1 to the Xpred to consider for the intercept.

Assignment 4
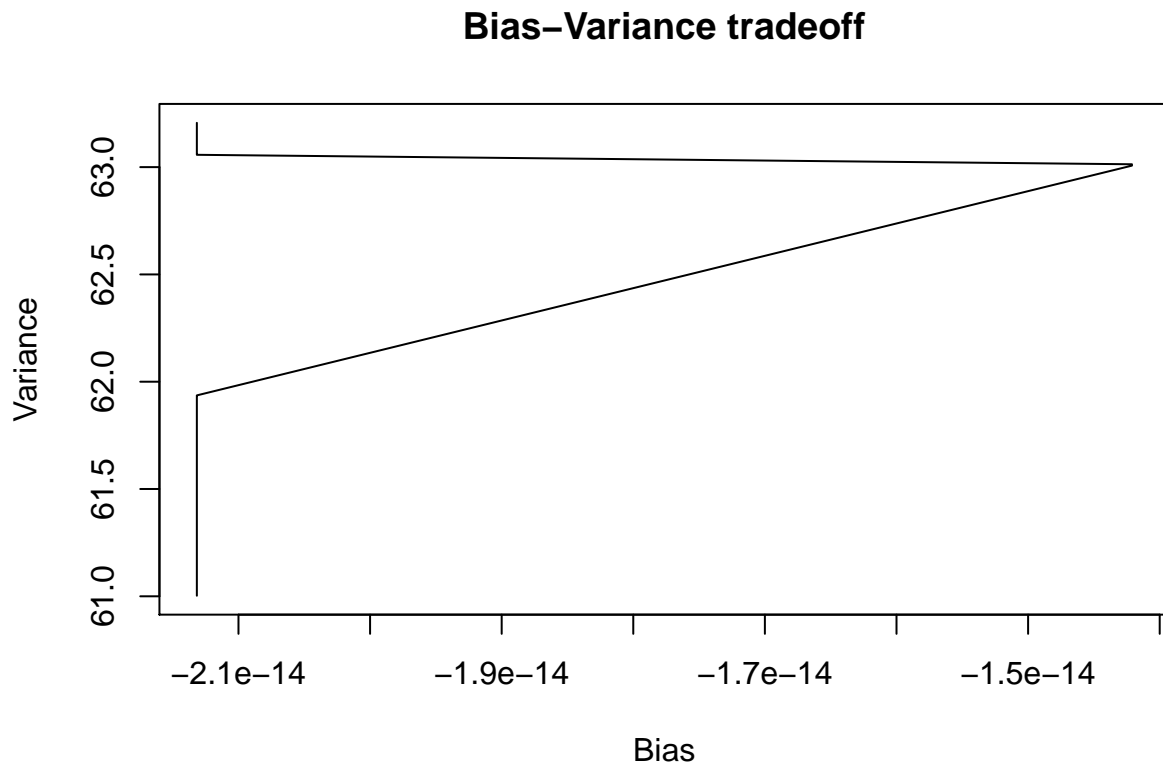
4.1 Linear Regression

Moisture Vs Protein
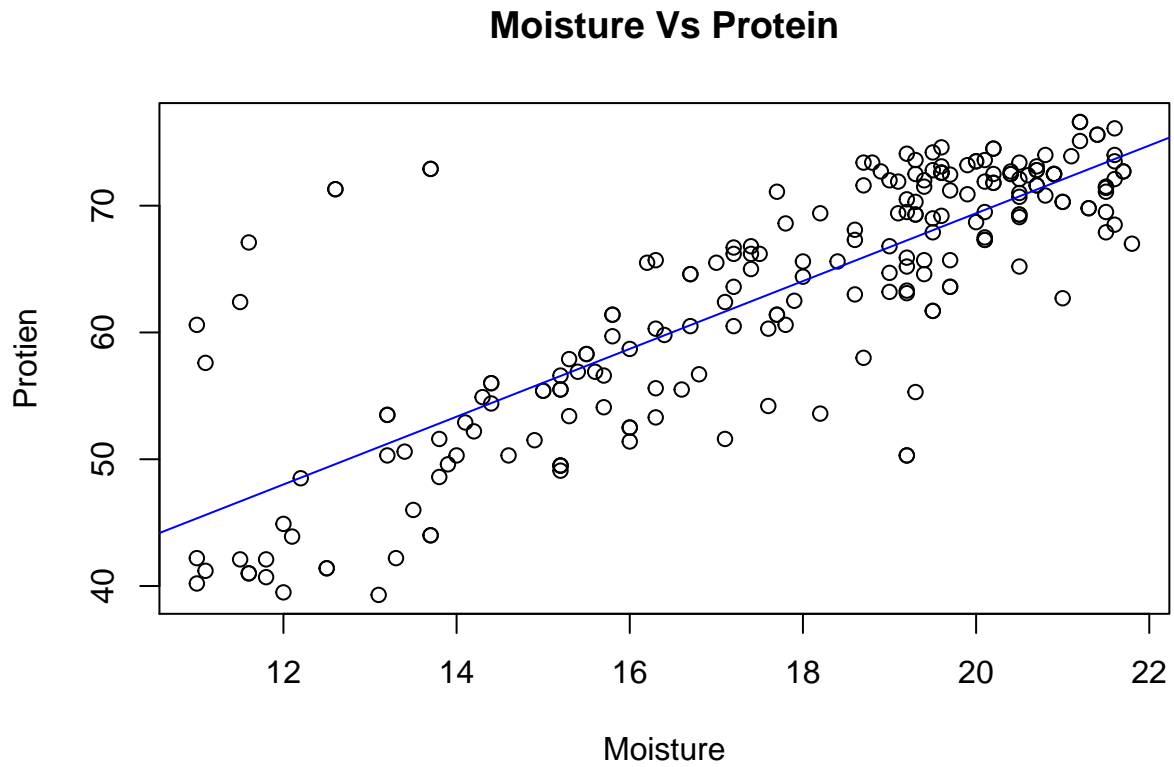
Moisture = 15.925 + 2.6738*Protein
Moisture is positively correlated with Protein. The p-value is less than 0.05.So therefore Protein is a siginificant variable for Moisture.

Bias–Variance tradeoff

When the degree of polynomial increases for linear regression, the MSE criterion decreases. The MSE criterion is minimum for the Model with degree of polynomial as 6. The data is normally distributed and the MSE value shows the shape of normal distribution curve when the degree of polynmial increases.This result is enough to support the fact that MSE can be used as criterion when fitting these type of models.The data is normally distributed and the MSE value shows the shape of normal distribution curve when the degree of polynmial increases.

Plot showing how training and validation MSE depend on i
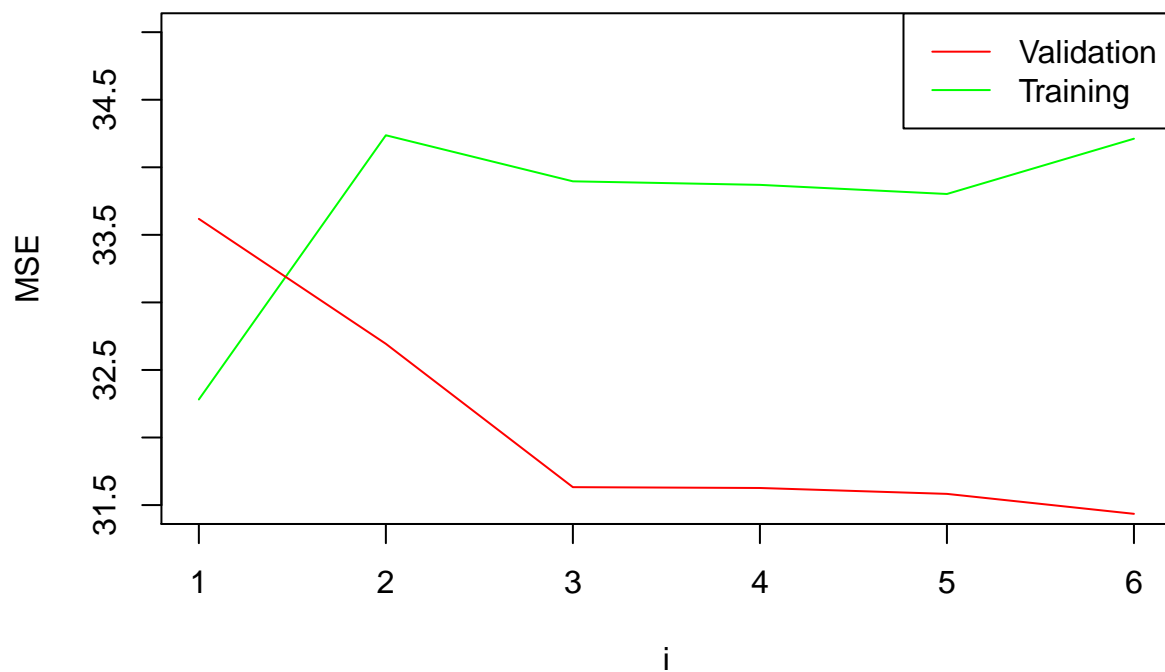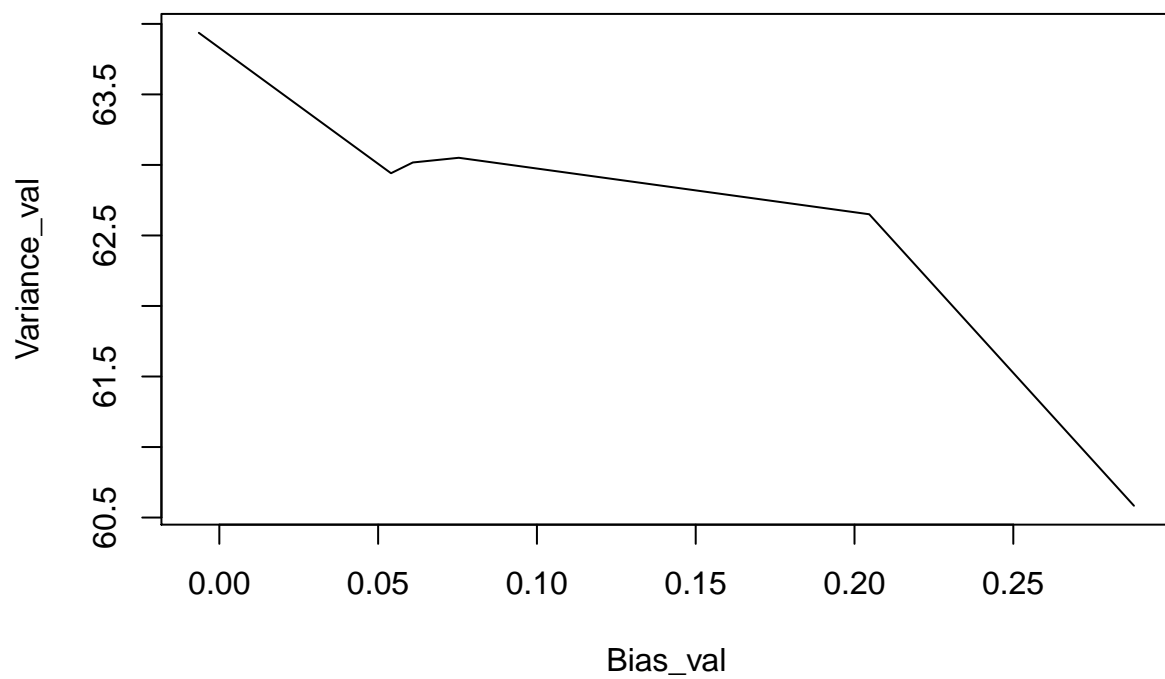

Bias−Variance tradeoff

When the degree of polynomial increases for linear regression, the MSE criterion increases. The MSE criterion is minimum for the Model with degree of polynomial as 6. The Mean Square Estimator criterion is Maximum likelihood Estimator for the normal distribution of errors.

4.4 StepAIC

```
## Start:  AIC=151.27
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##      Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##      Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##      Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##      Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##      Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##      Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##      Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##      Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##      Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##      Channel56 + Channel57 + Channel58 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel66 + Channel67 + Channel68 + Channel69 + Channel70 +
##      Channel71 + Channel72 + Channel73 + Channel74 + Channel75 +
##      Channel76 + Channel77 + Channel78 + Channel79 + Channel80 +
##      Channel81 + Channel82 + Channel83 + Channel84 + Channel85 +
##      Channel86 + Channel87 + Channel88 + Channel89 + Channel90 +
##      Channel91 + Channel92 + Channel93 + Channel94 + Channel95 +
##      Channel96 + Channel97 + Channel98 + Channel99 + Channel100
##
##               Df Sum of Sq    RSS    AIC
## - Channel70    1    0.0001 169.81 149.27
## - Channel89    1    0.0006 169.81 149.27
## - Channel57    1    0.0007 169.81 149.27
## - Channel66    1    0.0008 169.81 149.27
## - Channel100   1    0.0012 169.81 149.27
## - Channel58    1    0.0034 169.82 149.28
## - Channel38    1    0.0039 169.82 149.28
## - Channel53    1    0.0214 169.83 149.30
## - Channel9     1    0.0335 169.85 149.31
## - Channel77    1    0.0337 169.85 149.31
## - Channel91    1    0.0520 169.86 149.34
## - Channel93    1    0.1069 169.92 149.41
## - Channel33    1    0.1155 169.93 149.42
## - Channel72    1    0.1158 169.93 149.42
## - Channel49    1    0.1316 169.94 149.44
## - Channel97    1    0.1479 169.96 149.46
## - Channel82    1    0.1658 169.98 149.48
## - Channel48    1    0.1814 169.99 149.50
## - Channel90    1    0.2315 170.04 149.56
## - Channel96    1    0.2356 170.05 149.57
## - Channel86    1    0.2415 170.05 149.58
## - Channel17    1    0.2498 170.06 149.59
## - Channel65    1    0.3354 170.15 149.70
## - Channel76    1    0.3961 170.21 149.77
```

```
## - Channel10   1    0.3988 170.21 149.78
## - Channel84   1    0.4414 170.25 149.83
## - Channel23   1    0.4984 170.31 149.90
## - Channel83   1    0.5107 170.32 149.92
## - Channel95   1    0.5140 170.33 149.92
## - Channel88   1    0.6058 170.42 150.04
## - Channel62   1    0.6163 170.43 150.05
## - Channel94   1    0.6665 170.48 150.11
## - Channel3    1    0.6712 170.48 150.12
## - Channel43   1    0.6809 170.49 150.13
## - Channel92   1    0.7409 170.55 150.21
## - Channel35   1    0.7422 170.56 150.21
## - Channel34   1    0.7579 170.57 150.23
## - Channel6    1    0.8013 170.61 150.28
## - Channel20   1    0.9537 170.77 150.48
## - Channel98   1    0.9845 170.80 150.51
## - Channel26   1    1.0235 170.84 150.56
## - Channel18   1    1.0793 170.89 150.63
## - Channel16   1    1.1124 170.93 150.68
## - Channel44   1    1.1378 170.95 150.71
## - Channel21   1    1.3136 171.13 150.93
## - Channel32   1    1.4590 171.27 151.11
## - Channel19   1    1.4682 171.28 151.12
## - Channel11   1    1.4804 171.29 151.14
## - Channel8    1    1.4806 171.29 151.14
## - Channel7    1    1.4813 171.29 151.14
## - Channel15   1    1.5837 171.40 151.27
## <none>             169.81 151.27
## - Channel67   1    1.5877 171.40 151.27
## - Channel78   1    1.6063 171.42 151.30
## - Channel27   1    1.6209 171.43 151.31
## - Channel75   1    1.6228 171.44 151.32
## - Channel99   1    1.6327 171.44 151.33
## - Channel24   1    1.8099 171.62 151.55
## - Channel31   1    1.8184 171.63 151.56
## - Channel71   1    2.1342 171.95 151.96
## - Channel85   1    2.5506 172.36 152.48
## - Channel87   1    2.6646 172.48 152.62
## - Channel50   1    2.6742 172.49 152.63
## - Channel47   1    2.8240 172.64 152.82
## - Channel37   1    3.0349 172.85 153.08
## - Channel5    1    3.0745 172.89 153.13
## - Channel52   1    3.0985 172.91 153.16
## - Channel14   1    3.1243 172.94 153.19
## - Channel46   1    3.1490 172.96 153.22
## - Channel40   1    3.2774 173.09 153.38
## - Channel4    1    3.3777 173.19 153.51
## - Channel41   1    3.4420 173.25 153.59
## - Channel42   1    3.5931 173.41 153.77
## - Channel22   1    3.8281 173.64 154.06
## - Channel13   1    4.1826 174.00 154.50
## - Channel59   1    4.3155 174.13 154.67
## - Channel81   1    4.5315 174.34 154.93
## - Channel61   1    4.5416 174.35 154.95
```

```
## - Channel39   1    4.5499 174.36 154.96
## - Channel36   1    4.9170 174.73 155.41
## - Channel30   1    5.2904 175.10 155.87
## - Channel12   1    5.3107 175.12 155.89
## - Channel56   1    5.6245 175.44 156.28
## - Channel25   1    5.6392 175.45 156.30
## - Channel51   1    5.8157 175.63 156.51
## - Channel74   1    5.8388 175.65 156.54
## - Channel79   1    6.0704 175.88 156.82
## - Channel69   1    6.6696 176.48 157.56
## - Channel54   1    6.9667 176.78 157.92
## - Channel2    1    7.2457 177.06 158.25
## - Channel63   1    7.5845 177.40 158.67
## - Channel68   1    8.4200 178.23 159.68
## - Channel45   1    9.9029 179.72 161.46
## - Channel64   1   10.2163 180.03 161.83
## - Channel73   1   12.0678 181.88 164.03
## - Channel60   1   12.7152 182.53 164.80
## - Channel28   1   12.9807 182.79 165.11
## - Channel55   1   13.2807 183.09 165.46
## - Channel80   1   15.5434 185.36 168.10
## - Channel29   1   15.6164 185.43 168.19
## - Channel1    1   19.6098 189.42 172.77
##
## Step:  AIC=149.27
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##     Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##     Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##     Channel56 + Channel57 + Channel58 + Channel59 + Channel60 +
##     Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##     Channel66 + Channel67 + Channel68 + Channel69 + Channel71 +
##     Channel72 + Channel73 + Channel74 + Channel75 + Channel76 +
##     Channel77 + Channel78 + Channel79 + Channel80 + Channel81 +
##     Channel82 + Channel83 + Channel84 + Channel85 + Channel86 +
##     Channel87 + Channel88 + Channel89 + Channel90 + Channel91 +
##     Channel92 + Channel93 + Channel94 + Channel95 + Channel96 +
##     Channel97 + Channel98 + Channel99 + Channel100
##
##              Df Sum of Sq    RSS    AIC
## - Channel89   1    0.0006 169.81 147.27
## - Channel57   1    0.0007 169.81 147.27
## - Channel66   1    0.0008 169.81 147.27
## - Channel100  1    0.0012 169.81 147.27
## - Channel58   1    0.0034 169.82 147.28
## - Channel38   1    0.0039 169.82 147.28
## - Channel53   1    0.0225 169.84 147.30
```

9

```
## - Channel9    1    0.0336 169.85 147.31
## - Channel77   1    0.0339 169.85 147.31
## - Channel91   1    0.0530 169.87 147.34
## - Channel93   1    0.1078 169.92 147.41
## - Channel33   1    0.1155 169.93 147.42
## - Channel72   1    0.1223 169.94 147.43
## - Channel49   1    0.1322 169.94 147.44
## - Channel97   1    0.1506 169.96 147.46
## - Channel82   1    0.1671 169.98 147.48
## - Channel48   1    0.1814 169.99 147.50
## - Channel90   1    0.2326 170.04 147.57
## - Channel96   1    0.2376 170.05 147.57
## - Channel86   1    0.2417 170.05 147.58
## - Channel17   1    0.2507 170.06 147.59
## - Channel65   1    0.3365 170.15 147.70
## - Channel10   1    0.3996 170.21 147.78
## - Channel76   1    0.4099 170.22 147.79
## - Channel84   1    0.4418 170.25 147.83
## - Channel23   1    0.5051 170.32 147.91
## - Channel83   1    0.5125 170.32 147.92
## - Channel95   1    0.5170 170.33 147.93
## - Channel88   1    0.6084 170.42 148.04
## - Channel62   1    0.6698 170.48 148.12
## - Channel3    1    0.6723 170.49 148.12
## - Channel94   1    0.6769 170.49 148.13
## - Channel43   1    0.6919 170.50 148.15
## - Channel92   1    0.7420 170.55 148.21
## - Channel35   1    0.7454 170.56 148.21
## - Channel34   1    0.7618 170.57 148.23
## - Channel6    1    0.8013 170.61 148.28
## - Channel20   1    0.9608 170.77 148.49
## - Channel98   1    0.9844 170.80 148.51
## - Channel26   1    1.0667 170.88 148.62
## - Channel18   1    1.0916 170.90 148.65
## - Channel16   1    1.1370 170.95 148.71
## - Channel44   1    1.1503 170.96 148.72
## - Channel21   1    1.3389 171.15 148.96
## - Channel32   1    1.4638 171.28 149.12
## - Channel19   1    1.4720 171.28 149.13
## - Channel7    1    1.4832 171.30 149.14
## - Channel8    1    1.4848 171.30 149.14
## - Channel11   1    1.4860 171.30 149.15
## <none>                   169.81 149.27
## - Channel15   1    1.5940 171.41 149.28
## - Channel78   1    1.6070 171.42 149.30
## - Channel27   1    1.6390 171.45 149.34
## - Channel67   1    1.6476 171.46 149.35
## - Channel99   1    1.6561 171.47 149.36
## - Channel75   1    1.6990 171.51 149.41
## - Channel31   1    1.8283 171.64 149.57
## - Channel24   1    1.8363 171.65 149.59
## - Channel85   1    2.5505 172.36 150.48
## - Channel87   1    2.6646 172.48 150.62
## - Channel50   1    2.6796 172.49 150.64
```

```
## - Channel47    1    2.8251 172.64 150.82
## - Channel37    1    3.0559 172.87 151.11
## - Channel5     1    3.0754 172.89 151.13
## - Channel14    1    3.1252 172.94 151.19
## - Channel52    1    3.1885 173.00 151.27
## + Channel70    1    0.0001 169.81 151.27
## - Channel46    1    3.2199 173.03 151.31
## - Channel40    1    3.2814 173.09 151.39
## - Channel4     1    3.3829 173.19 151.51
## - Channel41    1    3.4451 173.26 151.59
## - Channel42    1    3.6091 173.42 151.79
## - Channel22    1    3.9097 173.72 152.17
## - Channel13    1    4.1850 174.00 152.51
## - Channel59    1    4.4799 174.29 152.87
## - Channel39    1    4.5556 174.37 152.96
## - Channel81    1    4.6731 174.49 153.11
## - Channel36    1    4.9175 174.73 153.41
## - Channel61    1    5.2614 175.07 153.83
## - Channel30    1    5.3237 175.14 153.91
## - Channel12    1    5.3488 175.16 153.94
## - Channel71    1    5.3682 175.18 153.96
## - Channel56    1    5.7691 175.58 154.46
## - Channel51    1    5.8165 175.63 154.51
## - Channel74    1    5.9838 175.80 154.72
## - Channel25    1    6.0108 175.82 154.75
## - Channel79    1    6.0842 175.90 154.84
## - Channel2     1    7.2628 177.07 156.28
## - Channel54    1    7.4640 177.28 156.52
## - Channel63    1    7.7317 177.54 156.84
## - Channel45    1    9.9613 179.77 159.53
## - Channel68    1   10.0020 179.81 159.58
## - Channel64    1   10.2820 180.09 159.91
## - Channel73    1   12.1699 181.98 162.15
## - Channel28    1   13.0365 182.85 163.18
## - Channel60    1   13.3948 183.21 163.60
## - Channel55    1   13.7054 183.52 163.96
## - Channel69    1   14.2342 184.05 164.58
## - Channel29    1   15.6500 185.46 166.23
## - Channel80    1   15.8681 185.68 166.48
## - Channel1     1   19.6315 189.44 170.79
##
## Step:  AIC=147.27
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##     Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##     Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##     Channel56 + Channel57 + Channel58 + Channel59 + Channel60 +
```

```
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel66 + Channel67 + Channel68 + Channel69 + Channel71 +
##      Channel72 + Channel73 + Channel74 + Channel75 + Channel76 +
##      Channel77 + Channel78 + Channel79 + Channel80 + Channel81 +
##      Channel82 + Channel83 + Channel84 + Channel85 + Channel86 +
##      Channel87 + Channel88 + Channel90 + Channel91 + Channel92 +
##      Channel93 + Channel94 + Channel95 + Channel96 + Channel97 +
##      Channel98 + Channel99 + Channel100
##
##               Df Sum of Sq    RSS    AIC
## - Channel66    1    0.0004 169.81 145.27
## - Channel57    1    0.0009 169.81 145.27
## - Channel100   1    0.0010 169.81 145.27
## - Channel38    1    0.0036 169.82 145.28
## - Channel58    1    0.0037 169.82 145.28
## - Channel53    1    0.0233 169.84 145.30
## - Channel9     1    0.0330 169.85 145.31
## - Channel77    1    0.0336 169.85 145.31
## - Channel91    1    0.0568 169.87 145.34
## - Channel93    1    0.1092 169.92 145.41
## - Channel33    1    0.1151 169.93 145.42
## - Channel72    1    0.1277 169.94 145.44
## - Channel49    1    0.1324 169.94 145.44
## - Channel97    1    0.1520 169.97 145.47
## - Channel82    1    0.1665 169.98 145.48
## - Channel48    1    0.1819 170.00 145.50
## - Channel96    1    0.2374 170.05 145.57
## - Channel17    1    0.2518 170.06 145.59
## - Channel86    1    0.2527 170.07 145.59
## - Channel10    1    0.4018 170.22 145.78
## - Channel76    1    0.4153 170.23 145.80
## - Channel65    1    0.4238 170.24 145.81
## - Channel84    1    0.4432 170.26 145.83
## - Channel90    1    0.4653 170.28 145.86
## - Channel23    1    0.5045 170.32 145.91
## - Channel83    1    0.5181 170.33 145.93
## - Channel95    1    0.5188 170.33 145.93
## - Channel94    1    0.6781 170.49 146.13
## - Channel3     1    0.6817 170.50 146.13
## - Channel43    1    0.6941 170.51 146.15
## - Channel62    1    0.6967 170.51 146.15
## - Channel35    1    0.7491 170.56 146.22
## - Channel34    1    0.7613 170.57 146.24
## - Channel92    1    0.7673 170.58 146.24
## - Channel6     1    0.8080 170.62 146.29
## - Channel20    1    0.9648 170.78 146.49
## - Channel98    1    0.9849 170.80 146.52
## - Channel26    1    1.0717 170.88 146.63
## - Channel18    1    1.0910 170.90 146.65
## - Channel16    1    1.1422 170.96 146.71
## - Channel44    1    1.1505 170.96 146.72
## - Channel21    1    1.3387 171.15 146.96
## - Channel32    1    1.4644 171.28 147.12
## - Channel19    1    1.4777 171.29 147.14
```

```
## - Channel7     1    1.4853 171.30 147.15
## - Channel8     1    1.4853 171.30 147.15
## - Channel11    1    1.4873 171.30 147.15
## <none>              169.81 147.27
## - Channel15    1    1.6001 171.41 147.29
## - Channel88    1    1.6135 171.43 147.31
## - Channel78    1    1.6338 171.45 147.33
## - Channel27    1    1.6489 171.46 147.35
## - Channel99    1    1.6700 171.48 147.38
## - Channel75    1    1.8004 171.61 147.54
## - Channel67    1    1.8246 171.64 147.57
## - Channel31    1    1.8303 171.64 147.58
## - Channel24    1    1.8452 171.66 147.60
## - Channel85    1    2.5543 172.37 148.48
## - Channel50    1    2.6798 172.49 148.64
## - Channel47    1    2.8565 172.67 148.86
## - Channel37    1    3.0716 172.88 149.13
## - Channel5     1    3.0876 172.90 149.15
## - Channel14    1    3.1685 172.98 149.25
## + Channel89    1    0.0006 169.81 149.27
## + Channel70    1    0.0000 169.81 149.27
## - Channel52    1    3.1889 173.00 149.27
## - Channel46    1    3.2264 173.04 149.32
## - Channel40    1    3.2919 173.10 149.40
## - Channel87    1    3.3591 173.17 149.48
## - Channel4     1    3.3973 173.21 149.53
## - Channel41    1    3.4497 173.26 149.60
## - Channel42    1    3.6171 173.43 149.80
## - Channel22    1    3.9117 173.72 150.17
## - Channel13    1    4.2043 174.02 150.53
## - Channel59    1    4.4796 174.29 150.87
## - Channel39    1    4.5792 174.39 150.99
## - Channel81    1    4.7984 174.61 151.26
## - Channel36    1    4.9289 174.74 151.43
## - Channel61    1    5.3360 175.15 151.93
## - Channel30    1    5.3472 175.16 151.94
## - Channel12    1    5.3558 175.17 151.95
## - Channel71    1    5.3851 175.20 151.99
## - Channel51    1    5.8159 175.63 152.51
## - Channel25    1    6.0197 175.83 152.76
## - Channel79    1    6.0886 175.90 152.85
## - Channel74    1    6.0887 175.90 152.85
## - Channel56    1    6.2840 176.10 153.09
## - Channel2     1    7.2829 177.10 154.30
## - Channel54    1    7.7458 177.56 154.86
## - Channel63    1    7.8383 177.65 154.97
## - Channel45    1   10.0207 179.83 157.60
## - Channel68    1   10.1529 179.97 157.76
## - Channel64    1   10.9052 180.72 158.66
## - Channel73    1   12.1934 182.01 160.18
## - Channel28    1   13.1532 182.97 161.31
## - Channel60    1   13.5112 183.32 161.73
## - Channel69    1   14.2336 184.05 162.58
## - Channel55    1   14.7543 184.57 163.19
```

```
## - Channel29   1    15.8032 185.62 164.40
## - Channel80   1    16.2351 186.05 164.90
## - Channel1    1    19.6584 189.47 168.82
##
## Step:  AIC=145.27
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##       Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##       Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##       Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##       Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##       Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##       Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##       Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##       Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##       Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##       Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##       Channel56 + Channel57 + Channel58 + Channel59 + Channel60 +
##       Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##       Channel67 + Channel68 + Channel69 + Channel71 + Channel72 +
##       Channel73 + Channel74 + Channel75 + Channel76 + Channel77 +
##       Channel78 + Channel79 + Channel80 + Channel81 + Channel82 +
##       Channel83 + Channel84 + Channel85 + Channel86 + Channel87 +
##       Channel88 + Channel90 + Channel91 + Channel92 + Channel93 +
##       Channel94 + Channel95 + Channel96 + Channel97 + Channel98 +
##       Channel99 + Channel100
##
##                 Df Sum of Sq    RSS    AIC
## - Channel100   1     0.0010 169.81 143.28
## - Channel57    1     0.0020 169.81 143.28
## - Channel38    1     0.0035 169.82 143.28
## - Channel58    1     0.0070 169.82 143.28
## - Channel53    1     0.0259 169.84 143.31
## - Channel9     1     0.0327 169.85 143.31
## - Channel77    1     0.0335 169.85 143.32
## - Channel91    1     0.0565 169.87 143.34
## - Channel93    1     0.1131 169.93 143.42
## - Channel33    1     0.1147 169.93 143.42
## - Channel72    1     0.1279 169.94 143.44
## - Channel49    1     0.1320 169.94 143.44
## - Channel97    1     0.1531 169.97 143.47
## - Channel82    1     0.1692 169.98 143.49
## - Channel48    1     0.1870 170.00 143.51
## - Channel96    1     0.2376 170.05 143.57
## - Channel86    1     0.2531 170.07 143.59
## - Channel17    1     0.2739 170.09 143.62
## - Channel10    1     0.4026 170.22 143.78
## - Channel76    1     0.4496 170.26 143.84
## - Channel90    1     0.4722 170.29 143.87
## - Channel84    1     0.4731 170.29 143.87
## - Channel23    1     0.5123 170.33 143.92
## - Channel95    1     0.5232 170.34 143.94
## - Channel83    1     0.5585 170.37 143.98
## - Channel3     1     0.6847 170.50 144.14
## - Channel94    1     0.6864 170.50 144.14
```

```
## - Channel43   1    0.6958 170.51 144.15
## - Channel62   1    0.7038 170.52 144.16
## - Channel35   1    0.7508 170.56 144.22
## - Channel34   1    0.7635 170.58 144.24
## - Channel92   1    0.7707 170.58 144.25
## - Channel6    1    0.8155 170.63 144.30
## - Channel98   1    0.9932 170.81 144.53
## - Channel20   1    1.0509 170.86 144.60
## - Channel26   1    1.0983 170.91 144.66
## - Channel18   1    1.1083 170.92 144.67
## - Channel65   1    1.1328 170.95 144.70
## - Channel16   1    1.1459 170.96 144.72
## - Channel44   1    1.1764 170.99 144.76
## - Channel21   1    1.4009 171.21 145.04
## - Channel32   1    1.4665 171.28 145.12
## - Channel11   1    1.5018 171.31 145.17
## - Channel7    1    1.5031 171.32 145.17
## - Channel8    1    1.5146 171.33 145.18
## - Channel19   1    1.5556 171.37 145.23
## <none>                 169.81 145.27
## - Channel15   1    1.5997 171.41 145.29
## - Channel78   1    1.6337 171.45 145.33
## - Channel27   1    1.6556 171.47 145.36
## - Channel88   1    1.6756 171.49 145.38
## - Channel99   1    1.6825 171.50 145.39
## - Channel75   1    1.8001 171.61 145.54
## - Channel31   1    1.8408 171.65 145.59
## - Channel24   1    1.8892 171.70 145.65
## - Channel85   1    2.5994 172.41 146.54
## - Channel50   1    2.6887 172.50 146.65
## - Channel47   1    2.8637 172.68 146.87
## - Channel37   1    3.0792 172.89 147.14
## - Channel5    1    3.0943 172.91 147.16
## - Channel14   1    3.1681 172.98 147.25
## + Channel66   1    0.0004 169.81 147.27
## + Channel89   1    0.0003 169.81 147.27
## + Channel70   1    0.0001 169.81 147.27
## - Channel46   1    3.2465 173.06 147.34
## - Channel40   1    3.2915 173.10 147.40
## - Channel52   1    3.3225 173.14 147.44
## - Channel4    1    3.3990 173.21 147.53
## - Channel87   1    3.4154 173.23 147.56
## - Channel41   1    3.4494 173.26 147.60
## - Channel42   1    3.6174 173.43 147.81
## - Channel22   1    4.0587 173.87 148.35
## - Channel13   1    4.2098 174.02 148.54
## - Channel39   1    4.5849 174.40 149.00
## - Channel59   1    4.8152 174.63 149.28
## - Channel81   1    4.8582 174.67 149.34
## - Channel36   1    4.9481 174.76 149.45
## - Channel61   1    5.3360 175.15 149.93
## - Channel12   1    5.4109 175.22 150.02
## - Channel30   1    5.4127 175.23 150.02
## - Channel67   1    5.4681 175.28 150.09
```

```
## - Channel51    1    5.8337 175.65 150.53
## - Channel71    1    5.9542 175.77 150.68
## - Channel79    1    6.2035 176.02 150.99
## - Channel25    1    6.3485 176.16 151.16
## - Channel74    1    6.7785 176.59 151.69
## - Channel56    1    6.8145 176.63 151.73
## - Channel2     1    7.3478 177.16 152.38
## - Channel63    1    7.8426 177.66 152.98
## - Channel54    1    7.9031 177.72 153.05
## - Channel45    1   10.2850 180.10 155.92
## - Channel64    1   11.6907 181.50 157.59
## - Channel68    1   12.2542 182.07 158.25
## - Channel73    1   13.0267 182.84 159.16
## - Channel28    1   13.4707 183.28 159.69
## - Channel60    1   13.5184 183.33 159.74
## - Channel69    1   14.2350 184.05 160.58
## - Channel55    1   14.9952 184.81 161.47
## - Channel29    1   16.0287 185.84 162.67
## - Channel80    1   16.3030 186.12 162.98
## - Channel1     1   19.7022 189.52 166.87
##
## Step:  AIC=143.27
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##     Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##     Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##     Channel56 + Channel57 + Channel58 + Channel59 + Channel60 +
##     Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##     Channel67 + Channel68 + Channel69 + Channel71 + Channel72 +
##     Channel73 + Channel74 + Channel75 + Channel76 + Channel77 +
##     Channel78 + Channel79 + Channel80 + Channel81 + Channel82 +
##     Channel83 + Channel84 + Channel85 + Channel86 + Channel87 +
##     Channel88 + Channel90 + Channel91 + Channel92 + Channel93 +
##     Channel94 + Channel95 + Channel96 + Channel97 + Channel98 +
##     Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel57   1    0.0015 169.82 141.28
## - Channel38   1    0.0041 169.82 141.28
## - Channel58   1    0.0065 169.82 141.28
## - Channel53   1    0.0249 169.84 141.31
## - Channel9    1    0.0331 169.85 141.32
## - Channel77   1    0.0349 169.85 141.32
## - Channel91   1    0.0600 169.87 141.35
## - Channel33   1    0.1144 169.93 141.42
## - Channel93   1    0.1180 169.93 141.42
## - Channel72   1    0.1287 169.94 141.44
```

```
## - Channel49    1    0.1368 169.95 141.45
## - Channel97    1    0.1530 169.97 141.47
## - Channel82    1    0.1697 169.98 141.49
## - Channel48    1    0.1872 170.00 141.51
## - Channel96    1    0.2371 170.05 141.57
## - Channel86    1    0.2521 170.07 141.59
## - Channel17    1    0.2805 170.09 141.63
## - Channel10    1    0.4083 170.22 141.79
## - Channel76    1    0.4542 170.27 141.85
## - Channel90    1    0.4761 170.29 141.88
## - Channel84    1    0.4762 170.29 141.88
## - Channel23    1    0.5116 170.33 141.92
## - Channel95    1    0.5351 170.35 141.95
## - Channel83    1    0.5598 170.37 141.98
## - Channel3     1    0.6934 170.51 142.15
## - Channel62    1    0.7033 170.52 142.16
## - Channel94    1    0.7403 170.56 142.21
## - Channel35    1    0.7524 170.57 142.22
## - Channel43    1    0.7565 170.57 142.23
## - Channel34    1    0.7629 170.58 142.24
## - Channel92    1    0.7787 170.59 142.26
## - Channel6     1    0.8155 170.63 142.31
## - Channel20    1    1.0749 170.89 142.63
## - Channel26    1    1.0984 170.91 142.66
## - Channel18    1    1.1075 170.92 142.67
## - Channel65    1    1.1381 170.95 142.71
## - Channel16    1    1.1703 170.99 142.75
## - Channel44    1    1.2055 171.02 142.79
## - Channel98    1    1.3440 171.16 142.97
## - Channel21    1    1.4127 171.23 143.06
## - Channel32    1    1.4755 171.29 143.13
## - Channel7     1    1.5044 171.32 143.17
## - Channel8     1    1.5141 171.33 143.18
## - Channel11    1    1.5395 171.35 143.22
## - Channel19    1    1.5792 171.39 143.26
## <none>                    169.81 143.28
## - Channel15    1    1.6128 171.43 143.31
## - Channel27    1    1.6552 171.47 143.36
## - Channel88    1    1.6750 171.49 143.38
## - Channel75    1    1.7991 171.61 143.54
## - Channel78    1    1.8316 171.65 143.58
## - Channel31    1    1.8614 171.68 143.62
## - Channel24    1    1.8920 171.71 143.66
## - Channel85    1    2.6342 172.45 144.58
## - Channel50    1    2.6895 172.50 144.65
## - Channel47    1    2.9188 172.73 144.94
## - Channel5     1    3.0962 172.91 145.16
## - Channel37    1    3.1160 172.93 145.18
## + Channel100   1    0.0010 169.81 145.27
## + Channel66    1    0.0004 169.81 145.27
## + Channel89    1    0.0002 169.81 145.27
## + Channel70    1    0.0000 169.81 145.28
## - Channel40    1    3.3270 173.14 145.45
## - Channel46    1    3.3334 173.15 145.45
```

```
## - Channel14    1     3.3681 173.18 145.50
## - Channel52    1     3.3878 173.20 145.52
## - Channel4     1     3.4085 173.22 145.55
## - Channel87    1     3.4246 173.24 145.57
## - Channel41    1     3.4554 173.27 145.61
## - Channel42    1     3.8195 173.63 146.06
## - Channel22    1     4.0845 173.90 146.38
## - Channel39    1     4.5839 174.40 147.00
## - Channel13    1     4.6004 174.41 147.02
## - Channel59    1     4.8143 174.63 147.28
## - Channel81    1     4.8598 174.67 147.34
## - Channel36    1     4.9707 174.78 147.48
## - Channel30    1     5.4187 175.23 148.03
## - Channel61    1     5.4749 175.29 148.10
## - Channel67    1     5.5479 175.36 148.19
## - Channel12    1     5.7126 175.53 148.39
## - Channel51    1     5.8368 175.65 148.54
## - Channel71    1     5.9834 175.80 148.72
## - Channel79    1     6.2609 176.07 149.06
## - Channel25    1     6.3501 176.16 149.17
## - Channel74    1     6.8619 176.68 149.79
## - Channel56    1     7.0401 176.85 150.01
## - Channel2     1     7.3936 177.21 150.44
## - Channel63    1     7.8448 177.66 150.98
## - Channel54    1     8.0430 177.86 151.22
## - Channel45    1    10.3261 180.14 153.97
## - Channel64    1    11.6989 181.51 155.60
## - Channel68    1    12.3019 182.12 156.31
## - Channel99    1    12.7470 182.56 156.84
## - Channel73    1    13.0319 182.85 157.17
## - Channel28    1    13.5943 183.41 157.83
## - Channel60    1    13.6531 183.47 157.90
## - Channel69    1    14.3779 184.19 158.75
## - Channel55    1    15.1630 184.98 159.66
## - Channel29    1    16.0935 185.91 160.74
## - Channel80    1    16.4040 186.22 161.10
## - Channel1     1    19.7015 189.52 164.88
##
## Step:  AIC=141.28
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel38 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel43 + Channel44 + Channel45 +
##     Channel46 + Channel47 + Channel48 + Channel49 + Channel50 +
##     Channel51 + Channel52 + Channel53 + Channel54 + Channel55 +
##     Channel56 + Channel58 + Channel59 + Channel60 + Channel61 +
##     Channel62 + Channel63 + Channel64 + Channel65 + Channel67 +
##     Channel68 + Channel69 + Channel71 + Channel72 + Channel73 +
##     Channel74 + Channel75 + Channel76 + Channel77 + Channel78 +
```

```
##      Channel79 + Channel80 + Channel81 + Channel82 + Channel83 +
##      Channel84 + Channel85 + Channel86 + Channel87 + Channel88 +
##      Channel90 + Channel91 + Channel92 + Channel93 + Channel94 +
##      Channel95 + Channel96 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel38   1    0.0042 169.82 139.28
## - Channel58   1    0.0051 169.82 139.28
## - Channel53   1    0.0242 169.84 139.31
## - Channel9    1    0.0337 169.85 139.32
## - Channel77   1    0.0351 169.85 139.32
## - Channel91   1    0.0591 169.88 139.35
## - Channel33   1    0.1129 169.93 139.42
## - Channel72   1    0.1298 169.95 139.44
## - Channel93   1    0.1371 169.95 139.45
## - Channel49   1    0.1425 169.96 139.46
## - Channel97   1    0.1540 169.97 139.47
## - Channel82   1    0.1712 169.99 139.49
## - Channel48   1    0.2051 170.02 139.54
## - Channel96   1    0.2356 170.05 139.57
## - Channel86   1    0.2574 170.07 139.60
## - Channel17   1    0.2795 170.09 139.63
## - Channel10   1    0.4069 170.22 139.79
## - Channel76   1    0.4527 170.27 139.85
## - Channel90   1    0.4752 170.29 139.88
## - Channel23   1    0.5145 170.33 139.93
## - Channel84   1    0.5395 170.35 139.96
## - Channel95   1    0.5504 170.37 139.97
## - Channel83   1    0.5973 170.41 140.03
## - Channel3    1    0.6991 170.51 140.16
## - Channel62   1    0.7126 170.53 140.18
## - Channel35   1    0.7518 170.57 140.23
## - Channel34   1    0.7771 170.59 140.26
## - Channel43   1    0.7844 170.60 140.27
## - Channel94   1    0.7862 170.60 140.27
## - Channel6    1    0.8153 170.63 140.31
## - Channel92   1    0.8262 170.64 140.32
## - Channel18   1    1.1109 170.93 140.68
## - Channel26   1    1.1309 170.95 140.70
## - Channel20   1    1.1471 170.96 140.72
## - Channel65   1    1.1549 170.97 140.73
## - Channel16   1    1.1780 170.99 140.76
## - Channel44   1    1.2045 171.02 140.80
## - Channel98   1    1.3440 171.16 140.97
## - Channel21   1    1.4483 171.26 141.10
## - Channel32   1    1.4787 171.29 141.14
## - Channel7    1    1.5029 171.32 141.17
## - Channel8    1    1.5173 171.33 141.19
## - Channel11   1    1.5397 171.36 141.22
## <none>                    169.82 141.28
## - Channel15   1    1.6208 171.44 141.32
## - Channel27   1    1.6565 171.47 141.36
## - Channel88   1    1.6917 171.51 141.41
## - Channel19   1    1.6926 171.51 141.41
```

```
## - Channel75    1    1.8006 171.62 141.54
## - Channel78    1    1.8416 171.66 141.60
## - Channel31    1    1.8601 171.68 141.62
## - Channel24    1    1.9456 171.76 141.73
## - Channel85    1    2.6940 172.51 142.66
## - Channel50    1    2.7451 172.56 142.72
## - Channel47    1    3.0347 172.85 143.09
## - Channel5     1    3.0978 172.91 143.16
## - Channel37    1    3.1745 172.99 143.26
## + Channel57    1    0.0015 169.81 143.28
## + Channel66    1    0.0013 169.81 143.28
## + Channel100   1    0.0004 169.81 143.28
## + Channel89    1    0.0002 169.82 143.28
## + Channel70    1    0.0000 169.82 143.28
## - Channel40    1    3.3406 173.16 143.47
## - Channel14    1    3.3673 173.18 143.50
## - Channel46    1    3.3849 173.20 143.52
## - Channel52    1    3.4284 173.24 143.57
## - Channel4     1    3.4326 173.25 143.58
## - Channel41    1    3.4575 173.27 143.61
## - Channel87    1    3.5041 173.32 143.67
## - Channel42    1    3.9198 173.74 144.18
## - Channel22    1    4.1757 173.99 144.50
## - Channel39    1    4.5831 174.40 145.00
## - Channel13    1    4.6074 174.42 145.03
## - Channel59    1    4.8334 174.65 145.31
## - Channel81    1    4.9351 174.75 145.44
## - Channel36    1    5.0967 174.91 145.63
## - Channel30    1    5.4212 175.24 146.03
## - Channel67    1    5.5520 175.37 146.19
## - Channel61    1    5.5908 175.41 146.24
## - Channel12    1    5.7138 175.53 146.39
## - Channel51    1    5.8499 175.67 146.56
## - Channel71    1    5.9872 175.80 146.73
## - Channel79    1    6.3268 176.14 147.14
## - Channel25    1    6.5819 176.40 147.45
## - Channel74    1    6.8608 176.68 147.79
## - Channel2     1    7.5567 177.37 148.64
## - Channel54    1    8.0968 177.91 149.29
## - Channel63    1    8.6758 178.49 149.99
## - Channel45    1   10.4067 180.22 152.06
## - Channel56    1   11.7503 181.57 153.66
## - Channel68    1   12.3227 182.14 154.34
## - Channel64    1   12.3989 182.22 154.43
## - Channel99    1   12.7711 182.59 154.87
## - Channel73    1   13.0374 182.85 155.18
## - Channel28    1   13.6276 183.44 155.87
## - Channel60    1   13.8186 183.63 156.10
## - Channel69    1   14.3868 184.20 156.76
## - Channel55    1   15.9629 185.78 158.59
## - Channel29    1   16.1061 185.92 158.76
## - Channel80    1   16.4095 186.22 159.11
## - Channel1     1   19.8849 189.70 163.08
##
```

```
## Step:  AIC=139.28
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##      Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##      Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##      Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##      Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##      Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##      Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##      Channel42 + Channel43 + Channel44 + Channel45 + Channel46 +
##      Channel47 + Channel48 + Channel49 + Channel50 + Channel51 +
##      Channel52 + Channel53 + Channel54 + Channel55 + Channel56 +
##      Channel58 + Channel59 + Channel60 + Channel61 + Channel62 +
##      Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##      Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##      Channel75 + Channel76 + Channel77 + Channel78 + Channel79 +
##      Channel80 + Channel81 + Channel82 + Channel83 + Channel84 +
##      Channel85 + Channel86 + Channel87 + Channel88 + Channel90 +
##      Channel91 + Channel92 + Channel93 + Channel94 + Channel95 +
##      Channel96 + Channel97 + Channel98 + Channel99
##
##               Df Sum of Sq    RSS    AIC
## - Channel58    1    0.0071 169.83 137.29
## - Channel53    1    0.0239 169.84 137.31
## - Channel77    1    0.0330 169.85 137.32
## - Channel9     1    0.0333 169.85 137.32
## - Channel91    1    0.0577 169.88 137.35
## - Channel33    1    0.1117 169.93 137.42
## - Channel72    1    0.1256 169.95 137.44
## - Channel49    1    0.1391 169.96 137.46
## - Channel93    1    0.1435 169.96 137.46
## - Channel97    1    0.1633 169.98 137.49
## - Channel82    1    0.1770 170.00 137.51
## - Channel96    1    0.2314 170.05 137.57
## - Channel48    1    0.2402 170.06 137.59
## - Channel86    1    0.2532 170.07 137.60
## - Channel17    1    0.2878 170.11 137.65
## - Channel10    1    0.4123 170.23 137.80
## - Channel76    1    0.4565 170.28 137.86
## - Channel90    1    0.4712 170.29 137.88
## - Channel23    1    0.5104 170.33 137.93
## - Channel95    1    0.5476 170.37 137.97
## - Channel84    1    0.5881 170.41 138.03
## - Channel83    1    0.5948 170.41 138.03
## - Channel3     1    0.7004 170.52 138.17
## - Channel62    1    0.7154 170.54 138.19
## - Channel35    1    0.7521 170.57 138.23
## - Channel34    1    0.7731 170.59 138.26
## - Channel94    1    0.7820 170.60 138.27
## - Channel43    1    0.8052 170.62 138.30
## - Channel6     1    0.8139 170.63 138.31
## - Channel92    1    0.8310 170.65 138.33
## - Channel18    1    1.1152 170.94 138.69
## - Channel26    1    1.1319 170.95 138.71
```

```
## - Channel65     1    1.1635 170.98 138.75
## - Channel20     1    1.1743 170.99 138.76
## - Channel16     1    1.2187 171.04 138.82
## - Channel44     1    1.2311 171.05 138.84
## - Channel98     1    1.3436 171.16 138.98
## - Channel21     1    1.4498 171.27 139.11
## - Channel32     1    1.4777 171.30 139.15
## - Channel7      1    1.5194 171.34 139.20
## - Channel11     1    1.5357 171.36 139.22
## - Channel8      1    1.5471 171.37 139.23
## <none>                     169.82 139.28
## - Channel15     1    1.6189 171.44 139.32
## - Channel27     1    1.6525 171.47 139.36
## - Channel88     1    1.6878 171.51 139.41
## - Channel19     1    1.7118 171.53 139.44
## - Channel75     1    1.7968 171.62 139.54
## - Channel78     1    1.8407 171.66 139.60
## - Channel31     1    1.8602 171.68 139.62
## - Channel24     1    1.9686 171.79 139.76
## - Channel50     1    2.7791 172.60 140.77
## - Channel85     1    2.9324 172.75 140.96
## - Channel47     1    3.0722 172.89 141.14
## - Channel5      1    3.1066 172.93 141.18
## + Channel38     1    0.0042 169.82 141.28
## + Channel57     1    0.0016 169.82 141.28
## + Channel66     1    0.0011 169.82 141.28
## + Channel100    1    0.0009 169.82 141.28
## + Channel70     1    0.0001 169.82 141.28
## + Channel89     1    0.0001 169.82 141.28
## - Channel14     1    3.3731 173.19 141.51
## - Channel46     1    3.3812 173.20 141.52
## - Channel52     1    3.4305 173.25 141.58
## - Channel4      1    3.4454 173.27 141.60
## - Channel87     1    3.5017 173.32 141.67
## - Channel41     1    3.5091 173.33 141.68
## - Channel40     1    3.5692 173.39 141.75
## - Channel42     1    4.0307 173.85 142.32
## - Channel22     1    4.2078 174.03 142.54
## - Channel13     1    4.6032 174.42 143.03
## - Channel59     1    4.9062 174.73 143.41
## - Channel81     1    4.9487 174.77 143.46
## - Channel37     1    4.9499 174.77 143.46
## - Channel36     1    5.0949 174.91 143.64
## - Channel30     1    5.4189 175.24 144.03
## - Channel67     1    5.5547 175.38 144.20
## - Channel61     1    5.6244 175.44 144.29
## - Channel12     1    5.7100 175.53 144.39
## - Channel51     1    5.8768 175.70 144.60
## - Channel71     1    5.9983 175.82 144.75
## - Channel79     1    6.3659 176.19 145.19
## - Channel25     1    6.6052 176.43 145.49
## - Channel74     1    7.0477 176.87 146.02
## - Channel2      1    7.6550 177.47 146.76
## - Channel54     1    8.1184 177.94 147.32
```

```
## - Channel39    1      8.5516 178.37 147.84
## - Channel63    1      8.7131 178.53 148.04
## - Channel45    1     10.4603 180.28 150.13
## - Channel56    1     11.8577 181.68 151.79
## - Channel68    1     12.3192 182.14 152.34
## - Channel64    1     12.4057 182.23 152.44
## - Channel99    1     12.8950 182.72 153.02
## - Channel28    1     13.8025 183.62 154.08
## - Channel60    1     13.8150 183.63 154.10
## - Channel73    1     13.9243 183.74 154.22
## - Channel69    1     14.3825 184.20 154.76
## - Channel29    1     16.1366 185.96 156.80
## - Channel55    1     16.1734 185.99 156.84
## - Channel80    1     16.4202 186.24 157.13
## - Channel1     1     20.3813 190.20 161.65
##
## Step:  AIC=137.29
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel43 + Channel44 + Channel45 + Channel46 +
##     Channel47 + Channel48 + Channel49 + Channel50 + Channel51 +
##     Channel52 + Channel53 + Channel54 + Channel55 + Channel56 +
##     Channel59 + Channel60 + Channel61 + Channel62 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel72 + Channel73 + Channel74 + Channel75 +
##     Channel76 + Channel77 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel82 + Channel83 + Channel84 + Channel85 +
##     Channel86 + Channel87 + Channel88 + Channel90 + Channel91 +
##     Channel92 + Channel93 + Channel94 + Channel95 + Channel96 +
##     Channel97 + Channel98 + Channel99
##
##               Df Sum of Sq    RSS    AIC
## - Channel53    1      0.0251 169.85 135.32
## - Channel77    1      0.0340 169.86 135.33
## - Channel9     1      0.0402 169.87 135.34
## - Channel91    1      0.0543 169.88 135.36
## - Channel33    1      0.1081 169.94 135.43
## - Channel72    1      0.1272 169.95 135.45
## - Channel49    1      0.1353 169.96 135.46
## - Channel97    1      0.1581 169.99 135.49
## - Channel93    1      0.1668 169.99 135.50
## - Channel82    1      0.1798 170.01 135.52
## - Channel96    1      0.2338 170.06 135.59
## - Channel86    1      0.2475 170.07 135.60
## - Channel48    1      0.2571 170.08 135.62
## - Channel17    1      0.2948 170.12 135.66
## - Channel10    1      0.4053 170.23 135.80
## - Channel90    1      0.4648 170.29 135.88
```

```
## - Channel76   1     0.4658 170.29 135.88
## - Channel23   1     0.5041 170.33 135.93
## - Channel95   1     0.5406 170.37 135.97
## - Channel84   1     0.5852 170.41 136.03
## - Channel83   1     0.6113 170.44 136.06
## - Channel3    1     0.7264 170.55 136.21
## - Channel35   1     0.7535 170.58 136.24
## - Channel62   1     0.7572 170.59 136.25
## - Channel94   1     0.7807 170.61 136.28
## - Channel34   1     0.7952 170.62 136.29
## - Channel43   1     0.8003 170.63 136.30
## - Channel6    1     0.8076 170.63 136.31
## - Channel92   1     0.8847 170.71 136.41
## - Channel18   1     1.1108 170.94 136.69
## - Channel26   1     1.1258 170.95 136.71
## - Channel20   1     1.1683 171.00 136.76
## - Channel16   1     1.2483 171.08 136.87
## - Channel44   1     1.2483 171.08 136.87
## - Channel65   1     1.3172 171.14 136.95
## - Channel98   1     1.3968 171.22 137.05
## - Channel21   1     1.4467 171.27 137.12
## - Channel32   1     1.4736 171.30 137.15
## - Channel7    1     1.5133 171.34 137.20
## - Channel11   1     1.5349 171.36 137.22
## - Channel8    1     1.5402 171.37 137.23
## <none>               169.83 137.29
## - Channel15   1     1.6138 171.44 137.32
## - Channel88   1     1.6837 171.51 137.41
## - Channel27   1     1.6862 171.51 137.41
## - Channel19   1     1.7050 171.53 137.44
## - Channel75   1     1.7977 171.62 137.56
## - Channel78   1     1.8494 171.68 137.62
## - Channel31   1     1.8561 171.68 137.63
## - Channel24   1     2.0341 171.86 137.85
## - Channel50   1     2.7774 172.60 138.78
## - Channel85   1     2.9711 172.80 139.02
## - Channel5    1     3.1020 172.93 139.18
## + Channel58   1     0.0071 169.82 139.28
## + Channel38   1     0.0062 169.82 139.28
## + Channel66   1     0.0032 169.82 139.29
## + Channel100  1     0.0013 169.83 139.29
## + Channel70   1     0.0008 169.83 139.29
## + Channel57   1     0.0003 169.83 139.29
## + Channel89   1     0.0000 169.83 139.29
## - Channel47   1     3.2333 173.06 139.35
## - Channel14   1     3.3686 173.20 139.51
## - Channel46   1     3.4216 173.25 139.58
## - Channel52   1     3.4357 173.26 139.60
## - Channel4    1     3.4398 173.27 139.60
## - Channel87   1     3.4966 173.32 139.67
## - Channel41   1     3.5048 173.33 139.68
## - Channel40   1     3.5621 173.39 139.75
## - Channel42   1     4.0246 173.85 140.33
## - Channel22   1     4.2117 174.04 140.56
```

```
## - Channel13    1     4.5973 174.43 141.03
## - Channel81    1     5.1533 174.98 141.72
## - Channel36    1     5.3428 175.17 141.95
## - Channel30    1     5.4139 175.24 142.04
## - Channel37    1     5.4416 175.27 142.07
## - Channel67    1     5.5480 175.38 142.20
## - Channel61    1     5.6174 175.44 142.29
## - Channel12    1     5.7029 175.53 142.39
## - Channel51    1     5.9094 175.74 142.65
## - Channel71    1     6.0144 175.84 142.77
## - Channel79    1     6.3632 176.19 143.20
## - Channel25    1     6.6070 176.43 143.50
## - Channel74    1     7.0440 176.87 144.03
## - Channel2     1     7.6548 177.48 144.77
## - Channel54    1     8.1124 177.94 145.32
## - Channel39    1     8.6410 178.47 145.96
## - Channel63    1     8.7465 178.57 146.09
## - Channel45    1    10.9196 180.75 148.69
## - Channel68    1    12.3541 182.18 150.39
## - Channel59    1    12.5092 182.34 150.57
## - Channel56    1    12.8664 182.69 150.99
## - Channel64    1    13.1018 182.93 151.27
## - Channel99    1    13.3250 183.15 151.53
## - Channel28    1    13.8837 183.71 152.19
## - Channel73    1    13.9261 183.75 152.24
## - Channel69    1    14.4332 184.26 152.83
## - Channel29    1    16.1605 185.99 154.83
## - Channel55    1    16.1690 186.00 154.84
## - Channel60    1    16.7868 186.61 155.56
## - Channel80    1    17.0894 186.92 155.91
## - Channel1     1    20.5636 190.39 159.87
##
## Step:  AIC=135.32
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel9 + Channel10 +
##     Channel11 + Channel12 + Channel13 + Channel14 + Channel15 +
##     Channel16 + Channel17 + Channel18 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel23 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel33 + Channel34 + Channel35 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel43 + Channel44 + Channel45 + Channel46 +
##     Channel47 + Channel48 + Channel49 + Channel50 + Channel51 +
##     Channel52 + Channel54 + Channel55 + Channel56 + Channel59 +
##     Channel60 + Channel61 + Channel62 + Channel63 + Channel64 +
##     Channel65 + Channel67 + Channel68 + Channel69 + Channel71 +
##     Channel72 + Channel73 + Channel74 + Channel75 + Channel76 +
##     Channel77 + Channel78 + Channel79 + Channel80 + Channel81 +
##     Channel82 + Channel83 + Channel84 + Channel85 + Channel86 +
##     Channel87 + Channel88 + Channel90 + Channel91 + Channel92 +
##     Channel93 + Channel94 + Channel95 + Channel96 + Channel97 +
##     Channel98 + Channel99
##
##                 Df Sum of Sq    RSS    AIC
```

```
## - Channel9    1    0.0377 169.89 133.37
## - Channel77   1    0.0409 169.89 133.37
## - Channel91   1    0.0466 169.90 133.38
## - Channel33   1    0.1111 169.96 133.46
## - Channel49   1    0.1282 169.98 133.49
## - Channel72   1    0.1619 170.01 133.53
## - Channel97   1    0.1688 170.02 133.54
## - Channel82   1    0.1746 170.03 133.54
## - Channel93   1    0.1747 170.03 133.54
## - Channel96   1    0.2202 170.07 133.60
## - Channel86   1    0.2355 170.09 133.62
## - Channel48   1    0.2891 170.14 133.69
## - Channel17   1    0.2947 170.15 133.70
## - Channel90   1    0.4423 170.29 133.88
## - Channel10   1    0.4627 170.31 133.91
## - Channel76   1    0.4738 170.33 133.92
## - Channel95   1    0.5171 170.37 133.98
## - Channel23   1    0.5928 170.44 134.07
## - Channel83   1    0.6012 170.45 134.08
## - Channel84   1    0.6261 170.48 134.11
## - Channel35   1    0.7549 170.61 134.28
## - Channel94   1    0.7609 170.61 134.28
## - Channel34   1    0.7730 170.62 134.30
## - Channel3    1    0.7910 170.64 134.32
## - Channel62   1    0.7933 170.65 134.32
## - Channel43   1    0.8042 170.66 134.34
## - Channel6    1    0.9189 170.77 134.48
## - Channel92   1    0.9254 170.78 134.49
## - Channel18   1    1.1327 170.99 134.75
## - Channel26   1    1.1548 171.01 134.78
## - Channel20   1    1.1699 171.02 134.80
## - Channel16   1    1.2399 171.09 134.89
## - Channel44   1    1.2446 171.10 134.89
## - Channel65   1    1.3430 171.19 135.02
## - Channel98   1    1.3829 171.24 135.07
## - Channel21   1    1.4540 171.31 135.16
## - Channel32   1    1.4677 171.32 135.17
## - Channel8    1    1.5690 171.42 135.30
## <none>              169.85 135.32
## - Channel7    1    1.6639 171.52 135.42
## - Channel88   1    1.6664 171.52 135.42
## - Channel27   1    1.6703 171.52 135.43
## - Channel11   1    1.6781 171.53 135.44
## - Channel19   1    1.6890 171.54 135.45
## - Channel15   1    1.7727 171.62 135.56
## - Channel75   1    1.7727 171.62 135.56
## - Channel78   1    1.8429 171.69 135.64
## - Channel31   1    1.8612 171.71 135.67
## - Channel24   1    2.0570 171.91 135.91
## - Channel85   1    3.0926 172.94 137.20
## + Channel53   1    0.0251 169.83 137.29
## + Channel58   1    0.0083 169.84 137.31
## + Channel66   1    0.0068 169.85 137.31
## + Channel38   1    0.0061 169.85 137.31
```

```
## + Channel70    1    0.0043 169.85 137.32
## + Channel57    1    0.0009 169.85 137.32
## + Channel100   1    0.0001 169.85 137.32
## + Channel89    1    0.0000 169.85 137.32
## - Channel47    1    3.2381 173.09 137.38
## - Channel5     1    3.3153 173.17 137.48
## - Channel50    1    3.3216 173.17 137.49
## - Channel87    1    3.4744 173.33 137.68
## - Channel46    1    3.5740 173.43 137.80
## - Channel41    1    3.5757 173.43 137.80
## - Channel4     1    3.5916 173.44 137.82
## - Channel40    1    3.6663 173.52 137.91
## - Channel14    1    3.7389 173.59 138.00
## - Channel42    1    4.0650 173.92 138.41
## - Channel22    1    4.3559 174.21 138.77
## - Channel13    1    4.9588 174.81 139.51
## - Channel81    1    5.2480 175.10 139.87
## - Channel36    1    5.3518 175.20 139.99
## - Channel37    1    5.4337 175.29 140.09
## - Channel30    1    5.4714 175.32 140.14
## - Channel67    1    5.5233 175.38 140.20
## - Channel61    1    5.6168 175.47 140.32
## - Channel12    1    6.0905 175.94 140.90
## - Channel71    1    6.1437 176.00 140.96
## - Channel79    1    6.3874 176.24 141.26
## - Channel25    1    6.5913 176.44 141.51
## - Channel74    1    7.0240 176.88 142.03
## - Channel2     1    7.6516 177.50 142.80
## - Channel63    1    8.7217 178.57 144.09
## - Channel39    1    8.8837 178.74 144.28
## - Channel45    1   10.9559 180.81 146.76
## - Channel51    1   12.4066 182.26 148.48
## - Channel68    1   12.4103 182.26 148.48
## - Channel59    1   12.4841 182.34 148.57
## - Channel64    1   13.1323 182.99 149.33
## - Channel99    1   13.3453 183.20 149.59
## - Channel56    1   13.5574 183.41 149.83
## - Channel28    1   13.8614 183.71 150.19
## - Channel73    1   13.9809 183.83 150.33
## - Channel69    1   14.5346 184.39 150.98
## - Channel29    1   16.2358 186.09 152.95
## - Channel60    1   16.7809 186.63 153.58
## - Channel80    1   17.1900 187.04 154.05
## - Channel1     1   20.5713 190.42 157.90
## - Channel55    1   21.9610 191.81 159.47
## - Channel52    1   27.0521 196.90 165.10
## - Channel54    1   31.5950 201.45 170.00
##
## Step:  AIC=133.37
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##      Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##      Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##      Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
```

```
##      Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##      Channel32 + Channel33 + Channel34 + Channel35 + Channel36 +
##      Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##      Channel43 + Channel44 + Channel45 + Channel46 + Channel47 +
##      Channel48 + Channel49 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel67 + Channel68 + Channel69 + Channel71 + Channel72 +
##      Channel73 + Channel74 + Channel75 + Channel76 + Channel77 +
##      Channel78 + Channel79 + Channel80 + Channel81 + Channel82 +
##      Channel83 + Channel84 + Channel85 + Channel86 + Channel87 +
##      Channel88 + Channel90 + Channel91 + Channel92 + Channel93 +
##      Channel94 + Channel95 + Channel96 + Channel97 + Channel98 +
##      Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel91   1     0.032 169.92 131.41
## - Channel77   1     0.053 169.94 131.44
## - Channel33   1     0.112 170.00 131.51
## - Channel49   1     0.123 170.01 131.53
## - Channel72   1     0.163 170.05 131.58
## - Channel97   1     0.164 170.05 131.58
## - Channel93   1     0.176 170.07 131.59
## - Channel82   1     0.178 170.07 131.60
## - Channel96   1     0.202 170.09 131.63
## - Channel86   1     0.241 170.13 131.68
## - Channel48   1     0.293 170.18 131.74
## - Channel17   1     0.319 170.21 131.77
## - Channel90   1     0.414 170.30 131.89
## - Channel95   1     0.494 170.38 132.00
## - Channel76   1     0.528 170.42 132.04
## - Channel23   1     0.583 170.47 132.11
## - Channel84   1     0.602 170.49 132.13
## - Channel83   1     0.645 170.53 132.19
## - Channel35   1     0.740 170.63 132.31
## - Channel3    1     0.761 170.65 132.33
## - Channel34   1     0.768 170.66 132.34
## - Channel94   1     0.775 170.66 132.35
## - Channel43   1     0.783 170.67 132.36
## - Channel10   1     0.783 170.67 132.36
## - Channel62   1     0.814 170.70 132.40
## - Channel6    1     0.995 170.88 132.63
## - Channel92   1     1.017 170.91 132.65
## - Channel18   1     1.095 170.99 132.75
## - Channel26   1     1.131 171.02 132.80
## - Channel20   1     1.167 171.06 132.84
## - Channel44   1     1.207 171.10 132.89
## - Channel16   1     1.211 171.10 132.90
## - Channel65   1     1.353 171.24 133.08
## - Channel98   1     1.416 171.31 133.16
## - Channel21   1     1.435 171.33 133.18
## - Channel32   1     1.455 171.34 133.20
## <none>                    169.89 133.37
## - Channel27   1     1.633 171.52 133.43
```

```
## - Channel19    1        1.685 171.57 133.49
## - Channel88    1        1.707 171.60 133.52
## - Channel75    1        1.762 171.65 133.59
## - Channel11    1        1.762 171.65 133.59
## - Channel15    1        1.818 171.71 133.66
## - Channel31    1        1.832 171.72 133.68
## - Channel7     1        1.860 171.75 133.71
## - Channel78    1        1.897 171.79 133.76
## - Channel24    1        2.027 171.92 133.92
## - Channel8     1        2.275 172.16 134.23
## - Channel85    1        3.060 172.95 135.21
## + Channel9     1        0.038 169.85 135.32
## + Channel53    1        0.023 169.87 135.34
## + Channel58    1        0.015 169.88 135.35
## + Channel38    1        0.007 169.88 135.36
## + Channel66    1        0.005 169.88 135.37
## + Channel70    1        0.004 169.89 135.37
## + Channel57    1        0.002 169.89 135.37
## + Channel89    1        0.000 169.89 135.37
## + Channel100   1        0.000 169.89 135.37
## - Channel47    1        3.296 173.19 135.50
## - Channel50    1        3.339 173.23 135.56
## - Channel5     1        3.410 173.30 135.64
## - Channel87    1        3.525 173.41 135.78
## - Channel46    1        3.560 173.45 135.83
## - Channel41    1        3.607 173.50 135.89
## - Channel4     1        3.612 173.50 135.89
## - Channel40    1        3.668 173.56 135.96
## - Channel14    1        3.798 173.69 136.12
## - Channel42    1        4.067 173.96 136.46
## - Channel22    1        4.322 174.21 136.77
## - Channel13    1        4.992 174.88 137.60
## - Channel36    1        5.345 175.24 138.03
## - Channel81    1        5.370 175.26 138.06
## - Channel37    1        5.426 175.32 138.13
## - Channel30    1        5.436 175.33 138.14
## - Channel67    1        5.516 175.41 138.24
## - Channel61    1        5.731 175.62 138.50
## - Channel71    1        6.114 176.00 138.97
## - Channel12    1        6.136 176.03 139.00
## - Channel25    1        6.632 176.52 139.60
## - Channel79    1        6.785 176.68 139.79
## - Channel74    1        6.990 176.88 140.04
## - Channel2     1        7.632 177.52 140.82
## - Channel63    1        8.691 178.58 142.10
## - Channel39    1        8.846 178.74 142.28
## - Channel45    1       11.160 181.05 145.05
## - Channel68    1       12.373 182.26 146.49
## - Channel59    1       12.489 182.38 146.62
## - Channel51    1       12.529 182.42 146.67
## - Channel64    1       13.132 183.02 147.38
## - Channel99    1       13.317 183.21 147.60
## - Channel73    1       13.989 183.88 148.38
## - Channel56    1       14.213 184.10 148.65
```

```
## - Channel28    1    14.384 184.27 148.84
## - Channel69    1    14.524 184.41 149.01
## - Channel29    1    16.466 186.36 151.26
## - Channel60    1    16.843 186.73 151.69
## - Channel80    1    17.853 187.74 152.85
## - Channel1     1    20.978 190.87 156.40
## - Channel55    1    23.162 193.05 158.85
## - Channel52    1    27.396 197.29 163.51
## - Channel54    1    33.059 202.95 169.60
##
## Step:  AIC=131.41
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##      Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##      Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##      Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##      Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##      Channel32 + Channel33 + Channel34 + Channel35 + Channel36 +
##      Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##      Channel43 + Channel44 + Channel45 + Channel46 + Channel47 +
##      Channel48 + Channel49 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel67 + Channel68 + Channel69 + Channel71 + Channel72 +
##      Channel73 + Channel74 + Channel75 + Channel76 + Channel77 +
##      Channel78 + Channel79 + Channel80 + Channel81 + Channel82 +
##      Channel83 + Channel84 + Channel85 + Channel86 + Channel87 +
##      Channel88 + Channel90 + Channel92 + Channel93 + Channel94 +
##      Channel95 + Channel96 + Channel97 + Channel98 + Channel199
##
##               Df Sum of Sq    RSS    AIC
## - Channel77    1     0.055 169.98 129.48
## - Channel49    1     0.102 170.02 129.54
## - Channel33    1     0.123 170.04 129.57
## - Channel82    1     0.155 170.08 129.61
## - Channel72    1     0.179 170.10 129.64
## - Channel96    1     0.194 170.12 129.66
## - Channel97    1     0.213 170.13 129.68
## - Channel93    1     0.248 170.17 129.72
## - Channel86    1     0.255 170.18 129.73
## - Channel17    1     0.345 170.27 129.85
## - Channel48    1     0.350 170.27 129.85
## - Channel76    1     0.518 170.44 130.06
## - Channel23    1     0.552 170.47 130.11
## - Channel95    1     0.563 170.49 130.12
## - Channel83    1     0.613 170.53 130.19
## - Channel84    1     0.615 170.54 130.19
## - Channel35    1     0.747 170.67 130.35
## - Channel34    1     0.749 170.67 130.36
## - Channel43    1     0.753 170.68 130.36
## - Channel10    1     0.760 170.68 130.37
## - Channel3     1     0.776 170.70 130.39
## - Channel62    1     0.795 170.72 130.41
## - Channel94    1     0.835 170.76 130.46
```

```
## - Channel90    1      0.846 170.77 130.48
## - Channel26    1      1.101 171.02 130.80
## - Channel18    1      1.142 171.06 130.85
## - Channel6     1      1.170 171.09 130.89
## - Channel44    1      1.179 171.10 130.90
## - Channel20    1      1.208 171.13 130.93
## - Channel16    1      1.364 171.29 131.13
## - Channel98    1      1.386 171.31 131.16
## - Channel65    1      1.396 171.32 131.17
## - Channel21    1      1.405 171.33 131.18
## - Channel32    1      1.518 171.44 131.32
## <none>                      169.92 131.41
## - Channel27    1      1.603 171.53 131.43
## - Channel19    1      1.683 171.60 131.53
## - Channel88    1      1.708 171.63 131.56
## - Channel75    1      1.731 171.65 131.59
## - Channel11    1      1.776 171.70 131.65
## - Channel15    1      1.789 171.71 131.66
## - Channel78    1      1.903 171.82 131.81
## - Channel31    1      1.925 171.85 131.83
## - Channel7     1      2.123 172.04 132.08
## - Channel24    1      2.162 172.08 132.13
## - Channel8     1      2.477 172.40 132.52
## - Channel85    1      3.029 172.95 133.21
## + Channel91    1      0.032 169.89 133.37
## + Channel9     1      0.023 169.90 133.38
## + Channel53    1      0.017 169.91 133.39
## + Channel58    1      0.009 169.91 133.40
## + Channel89    1      0.006 169.92 133.40
## + Channel38    1      0.005 169.92 133.41
## + Channel66    1      0.003 169.92 133.41
## + Channel100   1      0.002 169.92 133.41
## + Channel57    1      0.001 169.92 133.41
## + Channel70    1      0.001 169.92 133.41
## - Channel50    1      3.321 173.24 133.57
## - Channel47    1      3.385 173.31 133.65
## - Channel87    1      3.499 173.42 133.79
## - Channel46    1      3.528 173.45 133.83
## - Channel41    1      3.575 173.50 133.89
## - Channel40    1      3.650 173.57 133.98
## - Channel5     1      3.742 173.66 134.09
## - Channel4     1      3.814 173.74 134.18
## - Channel14    1      3.826 173.75 134.20
## - Channel42    1      4.091 174.01 134.53
## - Channel92    1      4.151 174.07 134.60
## - Channel22    1      4.321 174.24 134.81
## - Channel13    1      5.125 175.05 135.80
## - Channel36    1      5.314 175.24 136.03
## - Channel37    1      5.398 175.32 136.13
## - Channel81    1      5.542 175.46 136.31
## - Channel67    1      5.587 175.51 136.37
## - Channel61    1      5.702 175.62 136.51
## - Channel30    1      5.734 175.66 136.55
## - Channel71    1      6.088 176.01 136.98
```

```
## - Channel12    1       6.291 176.21 137.23
## - Channel25    1       6.609 176.53 137.62
## - Channel79    1       6.810 176.73 137.86
## - Channel74    1       6.959 176.88 138.04
## - Channel2     1       7.853 177.78 139.12
## - Channel39    1       8.826 178.75 140.30
## - Channel63    1       9.366 179.29 140.95
## - Channel45    1      11.183 181.10 143.11
## - Channel59    1      12.460 182.38 144.62
## - Channel51    1      12.667 182.59 144.87
## - Channel68    1      12.735 182.66 144.95
## - Channel99    1      13.458 183.38 145.80
## - Channel64    1      13.470 183.39 145.81
## - Channel73    1      14.062 183.98 146.51
## - Channel56    1      14.189 184.11 146.65
## - Channel28    1      14.710 184.63 147.26
## - Channel69    1      15.129 185.05 147.75
## - Channel29    1      16.737 186.66 149.61
## - Channel60    1      16.824 186.75 149.71
## - Channel80    1      18.024 187.95 151.09
## - Channel1     1      21.506 191.43 155.03
## - Channel55    1      23.131 193.05 156.85
## - Channel52    1      28.199 198.12 162.42
## - Channel54    1      33.137 203.06 167.71
##
## Step:  AIC=129.48
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel33 + Channel34 + Channel35 + Channel36 +
##     Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##     Channel43 + Channel44 + Channel45 + Channel46 + Channel47 +
##     Channel48 + Channel49 + Channel50 + Channel51 + Channel52 +
##     Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##     Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##     Channel67 + Channel68 + Channel69 + Channel71 + Channel72 +
##     Channel73 + Channel74 + Channel75 + Channel76 + Channel78 +
##     Channel79 + Channel80 + Channel81 + Channel82 + Channel83 +
##     Channel84 + Channel85 + Channel86 + Channel87 + Channel88 +
##     Channel90 + Channel92 + Channel93 + Channel94 + Channel95 +
##     Channel96 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq     RSS    AIC
## - Channel49    1       0.093 170.07 127.60
## - Channel33    1       0.114 170.09 127.62
## - Channel72    1       0.156 170.13 127.68
## - Channel97    1       0.180 170.16 127.71
## - Channel82    1       0.190 170.17 127.72
## - Channel96    1       0.226 170.20 127.77
## - Channel86    1       0.275 170.25 127.83
## - Channel93    1       0.276 170.25 127.83
```

```
## - Channel17   1     0.316 170.29 127.88
## - Channel48   1     0.351 170.33 127.92
## - Channel76   1     0.496 170.47 128.11
## - Channel23   1     0.517 170.49 128.13
## - Channel84   1     0.571 170.55 128.20
## - Channel95   1     0.578 170.56 128.21
## - Channel10   1     0.710 170.69 128.38
## - Channel83   1     0.718 170.69 128.39
## - Channel35   1     0.738 170.72 128.41
## - Channel62   1     0.756 170.73 128.43
## - Channel3    1     0.796 170.77 128.49
## - Channel94   1     0.807 170.78 128.50
## - Channel43   1     0.815 170.79 128.51
## - Channel34   1     0.822 170.80 128.52
## - Channel90   1     0.860 170.84 128.56
## - Channel26   1     1.058 171.03 128.81
## - Channel18   1     1.131 171.11 128.91
## - Channel6    1     1.232 171.21 129.03
## - Channel20   1     1.344 171.32 129.17
## - Channel44   1     1.345 171.32 129.18
## - Channel65   1     1.356 171.33 129.19
## - Channel21   1     1.359 171.34 129.19
## - Channel16   1     1.397 171.37 129.24
## - Channel98   1     1.496 171.47 129.37
## - Channel32   1     1.586 171.56 129.48
## <none>              169.98 129.48
## - Channel88   1     1.689 171.67 129.61
## - Channel27   1     1.696 171.67 129.62
## - Channel15   1     1.734 171.71 129.66
## - Channel11   1     1.743 171.72 129.67
## - Channel75   1     1.763 171.74 129.70
## - Channel19   1     1.875 171.85 129.84
## - Channel31   1     2.093 172.07 130.11
## - Channel7    1     2.217 172.19 130.27
## - Channel24   1     2.275 172.25 130.34
## - Channel8    1     2.710 172.69 130.88
## - Channel78   1     2.816 172.79 131.01
## - Channel85   1     2.974 172.95 131.21
## + Channel77   1     0.055 169.92 131.41
## + Channel91   1     0.034 169.94 131.44
## + Channel9    1     0.032 169.94 131.44
## + Channel53   1     0.023 169.95 131.45
## + Channel58   1     0.012 169.97 131.47
## + Channel89   1     0.006 169.97 131.47
## + Channel70   1     0.003 169.97 131.48
## + Channel66   1     0.003 169.97 131.48
## + Channel100  1     0.003 169.97 131.48
## + Channel38   1     0.002 169.97 131.48
## + Channel57   1     0.002 169.97 131.48
## - Channel50   1     3.270 173.25 131.58
## - Channel47   1     3.394 173.37 131.73
## - Channel87   1     3.505 173.48 131.87
## - Channel40   1     3.641 173.62 132.04
## - Channel41   1     3.692 173.67 132.10
```

```
## - Channel14    1      3.776 173.75 132.20
## - Channel46    1      3.858 173.84 132.31
## - Channel5     1      3.937 173.91 132.40
## - Channel4     1      4.002 173.98 132.48
## - Channel92    1      4.249 174.23 132.79
## - Channel22    1      4.267 174.24 132.81
## - Channel42    1      4.294 174.27 132.84
## - Channel13    1      5.072 175.05 133.80
## - Channel37    1      5.410 175.39 134.22
## - Channel36    1      5.441 175.42 134.25
## - Channel81    1      5.494 175.47 134.32
## - Channel61    1      5.656 175.63 134.52
## - Channel67    1      5.851 175.83 134.76
## - Channel30    1      5.974 175.95 134.91
## - Channel12    1      6.257 176.23 135.25
## - Channel25    1      6.637 176.61 135.72
## - Channel79    1      6.849 176.83 135.97
## - Channel71    1      6.864 176.84 135.99
## - Channel74    1      7.283 177.26 136.50
## - Channel2     1      7.860 177.84 137.20
## - Channel39    1      8.771 178.75 138.30
## - Channel63    1     10.424 180.40 140.28
## - Channel51    1     12.703 182.68 142.98
## - Channel45    1     12.834 182.81 143.13
## - Channel59    1     13.074 183.05 143.41
## - Channel99    1     13.525 183.50 143.94
## - Channel68    1     13.537 183.51 143.96
## - Channel64    1     13.912 183.89 144.39
## - Channel73    1     14.238 184.22 144.78
## - Channel56    1     14.447 184.42 145.02
## - Channel28    1     14.707 184.68 145.32
## - Channel69    1     16.416 186.39 147.30
## - Channel29    1     16.774 186.75 147.71
## - Channel60    1     17.049 187.03 148.03
## - Channel80    1     17.969 187.95 149.09
## - Channel1     1     21.451 191.43 153.03
## - Channel55    1     23.409 193.38 155.22
## - Channel52    1     28.155 198.13 160.43
## - Channel54    1     33.460 203.44 166.12
##
## Step:  AIC=127.6
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel33 + Channel34 + Channel35 + Channel36 +
##     Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##     Channel43 + Channel44 + Channel45 + Channel46 + Channel47 +
##     Channel48 + Channel50 + Channel51 + Channel52 + Channel54 +
##     Channel55 + Channel56 + Channel59 + Channel60 + Channel61 +
##     Channel62 + Channel63 + Channel64 + Channel65 + Channel67 +
##     Channel68 + Channel69 + Channel71 + Channel72 + Channel73 +
```

```
##      Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##      Channel80 + Channel81 + Channel82 + Channel83 + Channel84 +
##      Channel85 + Channel86 + Channel87 + Channel88 + Channel90 +
##      Channel92 + Channel93 + Channel94 + Channel95 + Channel96 +
##      Channel97 + Channel98 + Channel99
##
##             Df Sum of Sq    RSS    AIC
## - Channel33  1     0.114 170.18 125.74
## - Channel82  1     0.151 170.22 125.79
## - Channel72  1     0.168 170.24 125.81
## - Channel96  1     0.193 170.26 125.84
## - Channel93  1     0.225 170.29 125.88
## - Channel97  1     0.237 170.31 125.90
## - Channel86  1     0.287 170.36 125.96
## - Channel17  1     0.322 170.39 126.00
## - Channel76  1     0.501 170.57 126.23
## - Channel23  1     0.515 170.59 126.25
## - Channel95  1     0.550 170.62 126.29
## - Channel84  1     0.557 170.63 126.30
## - Channel83  1     0.667 170.74 126.44
## - Channel62  1     0.712 170.78 126.50
## - Channel34  1     0.757 170.83 126.55
## - Channel90  1     0.782 170.85 126.58
## - Channel43  1     0.783 170.85 126.58
## - Channel35  1     0.786 170.86 126.59
## - Channel10  1     0.810 170.88 126.62
## - Channel94  1     0.823 170.89 126.64
## - Channel3   1     0.830 170.90 126.64
## - Channel26  1     1.131 171.20 127.02
## - Channel18  1     1.134 171.20 127.03
## - Channel65  1     1.294 171.36 127.23
## - Channel44  1     1.309 171.38 127.25
## - Channel21  1     1.328 171.40 127.27
## - Channel16  1     1.336 171.41 127.28
## - Channel6   1     1.364 171.43 127.31
## - Channel20  1     1.388 171.46 127.34
## - Channel98  1     1.413 171.48 127.38
## - Channel48  1     1.540 171.61 127.54
## - Channel32  1     1.567 171.64 127.57
## <none>                    170.07 127.60
## - Channel88  1     1.599 171.67 127.61
## - Channel75  1     1.672 171.74 127.70
## - Channel27  1     1.696 171.76 127.73
## - Channel11  1     1.814 171.88 127.88
## - Channel15  1     1.833 171.90 127.90
## - Channel19  1     1.851 171.92 127.92
## - Channel31  1     2.129 172.20 128.27
## - Channel24  1     2.263 172.33 128.44
## - Channel7   1     2.375 172.44 128.58
## - Channel8   1     2.748 172.82 129.04
## - Channel78  1     2.767 172.84 129.07
## - Channel85  1     2.907 172.98 129.24
## + Channel49  1     0.093 169.98 129.48
## + Channel77  1     0.046 170.02 129.54
```

```
## + Channel9     1     0.032 170.04 129.56
## + Channel53    1     0.019 170.05 129.57
## + Channel91    1     0.013 170.06 129.58
## + Channel57    1     0.013 170.06 129.58
## + Channel58    1     0.009 170.06 129.59
## + Channel89    1     0.002 170.07 129.59
## + Channel70    1     0.001 170.07 129.60
## + Channel38    1     0.000 170.07 129.60
## + Channel66    1     0.000 170.07 129.60
## + Channel100   1     0.000 170.07 129.60
## - Channel47    1     3.305 173.37 129.74
## - Channel87    1     3.430 173.50 129.89
## - Channel40    1     3.578 173.65 130.07
## - Channel41    1     3.611 173.68 130.12
## - Channel14    1     3.847 173.92 130.41
## - Channel4     1     4.087 174.16 130.70
## - Channel5     1     4.170 174.24 130.81
## - Channel46    1     4.193 174.26 130.83
## - Channel42    1     4.219 174.29 130.87
## - Channel92    1     4.240 174.31 130.89
## - Channel22    1     4.244 174.31 130.90
## - Channel13    1     5.091 175.16 131.94
## - Channel36    1     5.351 175.42 132.26
## - Channel37    1     5.375 175.44 132.29
## - Channel81    1     5.597 175.67 132.56
## - Channel61    1     5.675 175.75 132.66
## - Channel50    1     5.679 175.75 132.66
## - Channel67    1     6.168 176.24 133.26
## - Channel12    1     6.280 176.35 133.39
## - Channel30    1     6.287 176.36 133.40
## - Channel25    1     6.750 176.82 133.97
## - Channel79    1     6.778 176.85 134.00
## - Channel71    1     6.827 176.90 134.06
## - Channel74    1     7.216 177.29 134.53
## - Channel2     1     7.768 177.84 135.20
## - Channel39    1     8.785 178.85 136.43
## - Channel63    1    10.366 180.44 138.32
## - Channel45    1    12.843 182.91 141.25
## - Channel59    1    13.268 183.34 141.75
## - Channel99    1    13.460 183.53 141.97
## - Channel64    1    13.898 183.97 142.49
## - Channel68    1    14.061 184.13 142.68
## - Channel51    1    14.075 184.15 142.69
## - Channel73    1    14.295 184.37 142.95
## - Channel28    1    14.969 185.04 143.74
## - Channel56    1    15.166 185.24 143.96
## - Channel69    1    16.562 186.63 145.58
## - Channel60    1    17.076 187.15 146.17
## - Channel29    1    17.722 187.79 146.91
## - Channel80    1    17.876 187.95 147.09
## - Channel1     1    21.378 191.45 151.06
## - Channel55    1    23.795 193.86 153.75
## - Channel52    1    28.637 198.71 159.06
## - Channel54    1    33.473 203.54 164.23
```

```
##
## Step:  AIC=125.74
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
##     Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##     Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel82 + Channel83 + Channel84 + Channel85 +
##     Channel86 + Channel87 + Channel88 + Channel90 + Channel92 +
##     Channel93 + Channel94 + Channel95 + Channel96 + Channel97 +
##     Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel96   1     0.184 170.37 123.97
## - Channel93   1     0.187 170.37 123.98
## - Channel82   1     0.189 170.37 123.98
## - Channel72   1     0.196 170.38 123.99
## - Channel97   1     0.216 170.40 124.02
## - Channel86   1     0.266 170.45 124.08
## - Channel17   1     0.352 170.53 124.19
## - Channel76   1     0.460 170.64 124.32
## - Channel95   1     0.502 170.69 124.38
## - Channel84   1     0.520 170.70 124.40
## - Channel23   1     0.535 170.72 124.42
## - Channel62   1     0.694 170.88 124.62
## - Channel35   1     0.729 170.91 124.66
## - Channel83   1     0.764 170.95 124.70
## - Channel3    1     0.770 170.95 124.71
## - Channel43   1     0.803 170.99 124.75
## - Channel90   1     0.833 171.02 124.79
## - Channel94   1     0.845 171.03 124.81
## - Channel10   1     0.928 171.11 124.91
## - Channel26   1     1.067 171.25 125.09
## - Channel18   1     1.103 171.29 125.13
## - Channel20   1     1.281 171.46 125.35
## - Channel6    1     1.315 171.50 125.40
## - Channel16   1     1.325 171.51 125.41
## - Channel65   1     1.341 171.53 125.43
## - Channel44   1     1.380 171.56 125.48
## - Channel48   1     1.460 171.64 125.58
## - Channel21   1     1.510 171.69 125.64
## - Channel98   1     1.512 171.70 125.64
## <none>                     170.18 125.74
## - Channel88   1     1.597 171.78 125.75
## - Channel27   1     1.674 171.86 125.85
```

```
## - Channel75    1     1.746 171.93 125.94
## - Channel19    1     1.758 171.94 125.95
## - Channel15    1     1.813 172.00 126.02
## - Channel11    1     1.902 172.09 126.13
## - Channel24    1     2.165 172.35 126.46
## - Channel7     1     2.275 172.46 126.60
## - Channel34    1     2.276 172.46 126.60
## - Channel8     1     2.634 172.82 127.04
## - Channel78    1     2.686 172.87 127.11
## - Channel31    1     2.739 172.92 127.17
## - Channel85    1     2.889 173.07 127.36
## + Channel33    1     0.114 170.07 127.60
## + Channel49    1     0.093 170.09 127.62
## + Channel77    1     0.037 170.15 127.69
## + Channel9     1     0.029 170.15 127.70
## + Channel91    1     0.020 170.16 127.72
## + Channel53    1     0.020 170.16 127.72
## + Channel57    1     0.017 170.17 127.72
## + Channel58    1     0.004 170.18 127.74
## + Channel89    1     0.003 170.18 127.74
## + Channel66    1     0.002 170.18 127.74
## + Channel100   1     0.000 170.18 127.74
## + Channel70    1     0.000 170.18 127.74
## + Channel38    1     0.000 170.18 127.74
## - Channel47    1     3.269 173.45 127.83
## - Channel87    1     3.374 173.56 127.96
## - Channel40    1     3.641 173.82 128.29
## - Channel41    1     3.646 173.83 128.30
## - Channel14    1     3.800 173.98 128.49
## - Channel32    1     3.853 174.04 128.56
## - Channel4     1     3.986 174.17 128.72
## - Channel5     1     4.078 174.26 128.83
## - Channel46    1     4.204 174.39 128.99
## - Channel92    1     4.212 174.40 129.00
## - Channel42    1     4.237 174.42 129.03
## - Channel22    1     4.354 174.54 129.17
## - Channel13    1     5.038 175.22 130.01
## - Channel37    1     5.283 175.47 130.31
## - Channel36    1     5.333 175.52 130.38
## - Channel81    1     5.517 175.70 130.60
## - Channel61    1     5.591 175.77 130.69
## - Channel50    1     5.719 175.90 130.85
## - Channel67    1     6.177 176.36 131.41
## - Channel12    1     6.251 176.43 131.50
## - Channel25    1     6.693 176.88 132.03
## - Channel79    1     6.702 176.89 132.05
## - Channel71    1     6.880 177.06 132.26
## - Channel30    1     7.319 177.50 132.79
## - Channel2     1     8.094 178.28 133.73
## - Channel74    1     8.212 178.40 133.87
## - Channel39    1     8.844 179.03 134.63
## - Channel63    1    10.309 180.49 136.39
## - Channel45    1    13.090 183.27 139.67
## - Channel59    1    13.724 183.91 140.42
```

```
## - Channel99     1    13.796 183.98 140.50
## - Channel64     1    13.934 184.12 140.66
## - Channel68     1    14.429 184.61 141.24
## - Channel51     1    14.469 184.65 141.28
## - Channel28     1    14.924 185.11 141.81
## - Channel73     1    15.311 185.49 142.26
## - Channel56     1    15.526 185.71 142.51
## - Channel60     1    17.279 187.46 144.53
## - Channel69     1    17.465 187.65 144.75
## - Channel80     1    17.819 188.00 145.15
## - Channel29     1    18.952 189.13 146.44
## - Channel1      1    21.650 191.83 149.49
## - Channel55     1    24.406 194.59 152.56
## - Channel52     1    29.957 200.14 158.60
## - Channel54     1    34.649 204.83 163.59
##
## Step:  AIC=123.97
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
##     Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##     Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel82 + Channel83 + Channel84 + Channel85 +
##     Channel86 + Channel87 + Channel88 + Channel90 + Channel92 +
##     Channel93 + Channel94 + Channel95 + Channel97 + Channel98 +
##     Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel93    1     0.120 170.49 122.13
## - Channel72    1     0.228 170.60 122.26
## - Channel82    1     0.230 170.60 122.26
## - Channel86    1     0.282 170.65 122.33
## - Channel95    1     0.327 170.69 122.39
## - Channel17    1     0.347 170.71 122.41
## - Channel76    1     0.422 170.79 122.50
## - Channel35    1     0.588 170.96 122.72
## - Channel84    1     0.605 170.97 122.73
## - Channel23    1     0.668 171.03 122.81
## - Channel3     1     0.717 171.08 122.88
## - Channel94    1     0.758 171.13 122.93
## - Channel83    1     0.760 171.13 122.93
## - Channel90    1     0.783 171.15 122.96
## - Channel62    1     0.799 171.17 122.98
## - Channel10    1     0.858 171.22 123.05
## - Channel43    1     0.861 171.23 123.06
```

```
## - Channel18    1      0.980 171.35 123.21
## - Channel26    1      1.118 171.49 123.38
## - Channel20    1      1.137 171.50 123.40
## - Channel16    1      1.167 171.53 123.44
## - Channel97    1      1.321 171.69 123.64
## - Channel44    1      1.323 171.69 123.64
## - Channel98    1      1.332 171.70 123.65
## - Channel6     1      1.508 171.88 123.87
## - Channel88    1      1.531 171.90 123.90
## <none>               170.37 123.97
## - Channel65    1      1.596 171.96 123.98
## - Channel48    1      1.599 171.97 123.98
## - Channel27    1      1.617 171.98 124.00
## - Channel19    1      1.683 172.05 124.09
## - Channel75    1      1.690 172.06 124.10
## - Channel11    1      1.739 172.11 124.16
## - Channel21    1      1.763 172.13 124.19
## - Channel24    1      1.995 172.36 124.48
## - Channel15    1      2.021 172.39 124.51
## - Channel7     1      2.530 172.90 125.14
## - Channel34    1      2.573 172.94 125.20
## - Channel8     1      2.628 173.00 125.27
## - Channel31    1      2.660 173.03 125.31
## - Channel85    1      2.936 173.30 125.65
## + Channel96    1      0.184 170.18 125.74
## - Channel78    1      3.015 173.38 125.75
## + Channel33    1      0.105 170.26 125.84
## + Channel77    1      0.063 170.30 125.89
## + Channel49    1      0.060 170.31 125.90
## - Channel47    1      3.167 173.53 125.93
## + Channel57    1      0.021 170.35 125.95
## + Channel91    1      0.018 170.35 125.95
## + Channel9     1      0.018 170.35 125.95
## + Channel53    1      0.011 170.36 125.96
## + Channel66    1      0.006 170.36 125.97
## + Channel58    1      0.006 170.36 125.97
## + Channel89    1      0.005 170.36 125.97
## + Channel38    1      0.002 170.37 125.97
## + Channel70    1      0.001 170.37 125.97
## + Channel100   1      0.001 170.37 125.97
## - Channel87    1      3.342 173.71 126.15
## - Channel40    1      3.653 174.02 126.53
## - Channel41    1      3.658 174.03 126.54
## - Channel14    1      3.805 174.17 126.72
## - Channel32    1      3.856 174.22 126.79
## - Channel4     1      3.950 174.32 126.90
## - Channel92    1      4.033 174.40 127.00
## - Channel46    1      4.102 174.47 127.09
## - Channel5     1      4.176 174.54 127.18
## - Channel42    1      4.343 174.71 127.39
## - Channel22    1      4.730 175.10 127.86
## - Channel13    1      4.896 175.26 128.06
## - Channel37    1      5.100 175.47 128.31
## - Channel36    1      5.297 175.66 128.56
```

```
## - Channel81   1      5.412 175.78 128.70
## - Channel61   1      5.748 176.12 129.11
## - Channel50   1      5.942 176.31 129.34
## - Channel67   1      6.005 176.37 129.42
## - Channel12   1      6.067 176.44 129.50
## - Channel25   1      6.512 176.88 130.04
## - Channel71   1      6.718 177.09 130.29
## - Channel30   1      7.171 177.54 130.84
## - Channel79   1      7.393 177.76 131.11
## - Channel2    1      8.168 178.54 132.04
## - Channel74   1      8.500 178.87 132.44
## - Channel39   1      8.863 179.23 132.88
## - Channel63   1     10.606 180.97 134.96
## - Channel45   1     12.967 183.34 137.75
## - Channel59   1     13.542 183.91 138.42
## - Channel99   1     13.613 183.98 138.50
## - Channel68   1     14.249 184.62 139.24
## - Channel51   1     14.385 184.75 139.40
## - Channel28   1     14.774 185.14 139.85
## - Channel56   1     15.348 185.72 140.52
## - Channel73   1     15.541 185.91 140.74
## - Channel64   1     15.575 185.94 140.78
## - Channel60   1     17.172 187.54 142.62
## - Channel69   1     17.335 187.70 142.81
## - Channel80   1     17.896 188.26 143.45
## - Channel29   1     18.769 189.14 144.44
## - Channel1    1     21.476 191.84 147.50
## - Channel55   1     24.239 194.61 150.57
## - Channel52   1     29.837 200.21 156.67
## - Channel54   1     34.539 204.91 161.66
##
## Step:  AIC=122.13
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
##     Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##     Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel82 + Channel83 + Channel84 + Channel85 +
##     Channel86 + Channel87 + Channel88 + Channel90 + Channel92 +
##     Channel94 + Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel82   1      0.201 170.69 120.38
## - Channel86   1      0.311 170.80 120.52
## - Channel17   1      0.346 170.83 120.56
```

```
## - Channel72     1        0.397 170.88 120.63
## - Channel76     1        0.398 170.89 120.63
## - Channel35     1        0.550 171.04 120.82
## - Channel84     1        0.551 171.04 120.82
## - Channel95     1        0.564 171.05 120.83
## - Channel23     1        0.652 171.14 120.95
## - Channel90     1        0.665 171.15 120.96
## - Channel83     1        0.743 171.23 121.06
## - Channel62     1        0.804 171.29 121.14
## - Channel3      1        0.817 171.31 121.15
## - Channel10     1        0.888 171.38 121.24
## - Channel43     1        0.902 171.39 121.26
## - Channel18     1        0.953 171.44 121.32
## - Channel16     1        1.057 171.54 121.45
## - Channel26     1        1.061 171.55 121.46
## - Channel20     1        1.090 171.58 121.50
## - Channel97     1        1.226 171.71 121.67
## - Channel44     1        1.291 171.78 121.75
## - Channel88     1        1.448 171.94 121.94
## - Channel65     1        1.493 171.98 122.00
## - Channel27     1        1.504 171.99 122.01
## - Channel6      1        1.551 172.04 122.07
## - Channel75     1        1.576 172.06 122.10
## <none>                         170.49 122.13
## - Channel98     1        1.593 172.08 122.13
## - Channel19     1        1.645 172.13 122.19
## - Channel48     1        1.658 172.15 122.21
## - Channel11     1        1.705 172.19 122.27
## - Channel21     1        1.787 172.28 122.37
## - Channel24     1        2.028 172.52 122.67
## - Channel15     1        2.414 172.90 123.15
## - Channel7      1        2.472 172.96 123.22
## - Channel8      1        2.513 173.00 123.27
## - Channel34     1        2.538 173.03 123.30
## - Channel31     1        2.555 173.04 123.32
## - Channel85     1        2.831 173.32 123.67
## - Channel78     1        2.959 173.45 123.83
## + Channel93     1        0.120 170.37 123.97
## + Channel96     1        0.117 170.37 123.98
## + Channel77     1        0.081 170.41 124.02
## + Channel33     1        0.076 170.41 124.03
## + Channel91     1        0.061 170.43 124.05
## + Channel49     1        0.033 170.46 124.08
## + Channel58     1        0.023 170.47 124.10
## + Channel89     1        0.017 170.47 124.10
## + Channel53     1        0.016 170.47 124.11
## + Channel9      1        0.015 170.47 124.11
## - Channel47     1        3.188 173.68 124.11
## + Channel57     1        0.006 170.48 124.12
## + Channel66     1        0.003 170.48 124.12
## + Channel38     1        0.000 170.49 124.12
## + Channel70     1        0.000 170.49 124.13
## + Channel100    1        0.000 170.49 124.13
## - Channel87     1        3.348 173.84 124.31
```

```
## - Channel41    1     3.707 174.19 124.75
## - Channel32    1     3.740 174.23 124.79
## - Channel40    1     3.743 174.23 124.79
## - Channel14    1     4.034 174.52 125.15
## - Channel4     1     4.042 174.53 125.16
## - Channel94    1     4.081 174.57 125.21
## - Channel46    1     4.092 174.58 125.22
## - Channel5     1     4.214 174.70 125.38
## - Channel42    1     4.444 174.93 125.66
## - Channel22    1     4.709 175.20 125.98
## - Channel13    1     4.851 175.34 126.16
## - Channel36    1     5.263 175.75 126.66
## - Channel37    1     5.407 175.90 126.84
## - Channel81    1     5.428 175.92 126.86
## - Channel12    1     5.952 176.44 127.50
## - Channel50    1     5.960 176.45 127.51
## - Channel61    1     6.159 176.65 127.75
## - Channel25    1     6.405 176.89 128.06
## - Channel67    1     6.500 176.99 128.17
## - Channel71    1     6.667 177.16 128.37
## - Channel30    1     7.061 177.55 128.85
## - Channel79    1     7.373 177.86 129.23
## - Channel2     1     8.066 178.55 130.06
## - Channel74    1     8.395 178.88 130.46
## - Channel92    1     8.492 178.98 130.58
## - Channel39    1     9.217 179.71 131.44
## - Channel63    1    10.504 180.99 132.98
## - Channel45    1    12.847 183.34 135.75
## - Channel59    1    14.227 184.72 137.36
## - Channel51    1    14.346 184.83 137.50
## - Channel68    1    14.347 184.83 137.50
## - Channel28    1    14.662 185.15 137.86
## - Channel99    1    14.763 185.25 137.98
## - Channel56    1    15.249 185.74 138.54
## - Channel64    1    15.461 185.95 138.79
## - Channel73    1    17.085 187.57 140.66
## - Channel69    1    17.275 187.76 140.88
## - Channel80    1    17.828 188.32 141.51
## - Channel60    1    18.728 189.22 142.53
## - Channel29    1    18.751 189.24 142.56
## - Channel1     1    21.465 191.95 145.62
## - Channel55    1    24.155 194.64 148.61
## - Channel52    1    29.730 200.22 154.69
## - Channel54    1    34.697 205.19 159.95
##
## Step:  AIC=120.38
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
```

```
##      Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##      Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##      Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##      Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##      Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##      Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##      Channel81 + Channel83 + Channel84 + Channel85 + Channel86 +
##      Channel87 + Channel88 + Channel90 + Channel92 + Channel94 +
##      Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel86   1     0.261 170.95 118.71
## - Channel17   1     0.280 170.97 118.73
## - Channel72   1     0.329 171.02 118.79
## - Channel76   1     0.487 171.18 118.99
## - Channel35   1     0.528 171.22 119.04
## - Channel23   1     0.611 171.30 119.15
## - Channel83   1     0.632 171.32 119.17
## - Channel95   1     0.662 171.35 119.21
## - Channel90   1     0.698 171.39 119.26
## - Channel3    1     0.830 171.52 119.42
## - Channel62   1     0.830 171.52 119.42
## - Channel43   1     0.854 171.54 119.45
## - Channel10   1     0.970 171.66 119.60
## - Channel84   1     0.983 171.67 119.61
## - Channel16   1     1.035 171.72 119.68
## - Channel26   1     1.040 171.73 119.69
## - Channel18   1     1.122 171.81 119.79
## - Channel44   1     1.168 171.86 119.84
## - Channel20   1     1.228 171.92 119.92
## - Channel97   1     1.442 172.13 120.19
## - Channel98   1     1.461 172.15 120.21
## - Channel65   1     1.493 172.18 120.25
## - Channel27   1     1.543 172.23 120.31
## - Channel88   1     1.574 172.26 120.35
## - Channel6    1     1.582 172.27 120.36
## - Channel48   1     1.588 172.28 120.37
## <none>                     170.69 120.38
## - Channel75   1     1.606 172.29 120.39
## - Channel19   1     1.677 172.37 120.48
## - Channel21   1     1.700 172.39 120.51
## - Channel11   1     1.940 172.63 120.81
## - Channel24   1     2.340 173.03 121.31
## - Channel15   1     2.385 173.07 121.36
## - Channel31   1     2.478 173.17 121.48
## - Channel34   1     2.522 173.21 121.53
## - Channel7    1     2.615 173.30 121.65
## - Channel8    1     2.693 173.38 121.75
## - Channel78   1     2.788 173.48 121.86
## + Channel82   1     0.201 170.49 122.13
## + Channel96   1     0.155 170.53 122.18
## + Channel77   1     0.126 170.56 122.22
## + Channel33   1     0.111 170.58 122.24
## + Channel93   1     0.092 170.60 122.26
```

```
## - Channel47    1        3.165 173.85 122.33
## + Channel58    1        0.031 170.66 122.34
## + Channel57    1        0.028 170.66 122.34
## + Channel91    1        0.025 170.66 122.35
## + Channel9     1        0.025 170.66 122.35
## + Channel53    1        0.015 170.67 122.36
## + Channel89    1        0.013 170.68 122.36
## + Channel49    1        0.011 170.68 122.37
## + Channel66    1        0.003 170.69 122.38
## + Channel38    1        0.002 170.69 122.38
## + Channel100   1        0.001 170.69 122.38
## + Channel70    1        0.001 170.69 122.38
## - Channel87    1        3.403 174.09 122.62
## - Channel85    1        3.465 174.15 122.70
## - Channel32    1        3.640 174.33 122.92
## - Channel41    1        3.779 174.47 123.09
## - Channel40    1        3.836 174.53 123.16
## - Channel4     1        3.923 174.61 123.27
## - Channel46    1        3.962 174.65 123.31
## - Channel14    1        3.984 174.67 123.34
## - Channel5     1        4.112 174.80 123.50
## - Channel94    1        4.269 174.96 123.69
## - Channel42    1        4.447 175.14 123.91
## - Channel22    1        4.674 175.36 124.19
## - Channel13    1        4.840 175.53 124.39
## - Channel36    1        5.249 175.94 124.89
## - Channel37    1        5.468 176.16 125.16
## - Channel50    1        5.859 176.55 125.64
## - Channel12    1        6.118 176.81 125.95
## - Channel61    1        6.346 177.03 126.23
## - Channel67    1        6.581 177.27 126.51
## - Channel25    1        6.860 177.55 126.85
## - Channel30    1        7.010 177.70 127.03
## - Channel71    1        7.029 177.72 127.06
## - Channel79    1        7.195 177.88 127.26
## - Channel2     1        8.026 178.72 128.26
## - Channel74    1        8.396 179.09 128.70
## - Channel92    1        8.474 179.16 128.80
## - Channel39    1        9.315 180.00 129.80
## - Channel63    1       10.620 181.31 131.36
## - Channel45    1       12.674 183.36 133.78
## - Channel81    1       13.696 184.38 134.97
## - Channel59    1       14.034 184.72 135.37
## - Channel51    1       14.231 184.92 135.60
## - Channel99    1       14.564 185.25 135.98
## - Channel68    1       14.787 185.48 136.24
## - Channel28    1       14.904 185.59 136.38
## - Channel64    1       15.428 186.12 136.98
## - Channel56    1       15.771 186.46 137.38
## - Channel73    1       17.016 187.71 138.81
## - Channel69    1       17.706 188.40 139.60
## - Channel60    1       18.533 189.22 140.54
## - Channel29    1       18.939 189.63 141.00
## - Channel80    1       19.111 189.80 141.20
```

```
## - Channel1    1     21.644 192.33 144.05
## - Channel55   1     24.832 195.52 147.58
## - Channel52   1     29.670 200.36 152.84
## - Channel54   1     35.277 205.97 158.77
##
## Step:  AIC=118.71
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
##     Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel72 + Channel73 + Channel74 +
##     Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel83 + Channel84 + Channel85 + Channel87 +
##     Channel88 + Channel90 + Channel92 + Channel94 + Channel95 +
##     Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel72   1     0.334 171.28 117.13
## - Channel17   1     0.430 171.38 117.25
## - Channel76   1     0.507 171.46 117.34
## - Channel90   1     0.516 171.47 117.36
## - Channel35   1     0.547 171.50 117.39
## - Channel83   1     0.554 171.50 117.40
## - Channel95   1     0.555 171.50 117.40
## - Channel43   1     0.694 171.64 117.58
## - Channel23   1     0.726 171.68 117.62
## - Channel62   1     0.762 171.71 117.66
## - Channel3    1     0.802 171.75 117.71
## - Channel26   1     1.004 171.95 117.97
## - Channel16   1     1.019 171.97 117.99
## - Channel44   1     1.043 171.99 118.02
## - Channel18   1     1.053 172.00 118.03
## - Channel20   1     1.121 172.07 118.11
## - Channel10   1     1.146 172.10 118.14
## - Channel97   1     1.291 172.24 118.33
## - Channel27   1     1.424 172.37 118.49
## - Channel65   1     1.430 172.38 118.50
## - Channel88   1     1.482 172.43 118.56
## - Channel98   1     1.493 172.44 118.58
## - Channel19   1     1.557 172.51 118.66
## - Channel6    1     1.566 172.52 118.67
## <none>                     170.95 118.71
## - Channel48   1     1.603 172.55 118.71
## - Channel75   1     1.654 172.60 118.78
## - Channel84   1     1.735 172.69 118.88
## - Channel21   1     1.867 172.82 119.04
```

```
## - Channel24     1      2.183 173.13 119.44
## - Channel11     1      2.209 173.16 119.47
## - Channel34     1      2.462 173.41 119.78
## - Channel31     1      2.513 173.46 119.84
## - Channel7      1      2.539 173.49 119.88
## - Channel15     1      2.658 173.61 120.02
## - Channel8      1      2.730 173.68 120.11
## + Channel86     1      0.261 170.69 120.38
## - Channel47     1      3.046 174.00 120.50
## + Channel96     1      0.156 170.79 120.51
## + Channel77     1      0.153 170.80 120.52
## + Channel82     1      0.151 170.80 120.52
## + Channel93     1      0.119 170.83 120.56
## + Channel33     1      0.083 170.87 120.60
## + Channel91     1      0.044 170.91 120.65
## + Channel9      1      0.026 170.92 120.67
## + Channel58     1      0.018 170.93 120.69
## + Channel49     1      0.015 170.94 120.69
## + Channel57     1      0.008 170.94 120.70
## + Channel100    1      0.006 170.94 120.70
## + Channel53     1      0.006 170.94 120.70
## + Channel66     1      0.005 170.94 120.70
## + Channel89     1      0.001 170.95 120.71
## + Channel38     1      0.001 170.95 120.71
## + Channel70     1      0.000 170.95 120.71
## - Channel78     1      3.312 174.26 120.83
## - Channel41     1      3.587 174.54 121.17
## - Channel32     1      3.617 174.57 121.21
## - Channel40     1      3.779 174.73 121.41
## - Channel4      1      3.828 174.78 121.47
## - Channel46     1      4.029 174.98 121.72
## - Channel5      1      4.119 175.07 121.83
## - Channel94     1      4.169 175.12 121.89
## - Channel42     1      4.188 175.14 121.91
## - Channel14     1      4.272 175.22 122.01
## - Channel22     1      4.995 175.94 122.90
## - Channel13     1      5.204 176.15 123.16
## - Channel36     1      5.386 176.34 123.38
## - Channel37     1      5.575 176.53 123.61
## - Channel61     1      6.318 177.27 124.51
## - Channel12     1      6.579 177.53 124.83
## - Channel25     1      6.632 177.58 124.89
## - Channel71     1      6.864 177.81 125.17
## - Channel50     1      7.203 178.15 125.58
## - Channel67     1      7.298 178.25 125.70
## - Channel30     1      7.467 178.42 125.90
## - Channel2      1      8.178 179.13 126.75
## - Channel87     1      8.209 179.16 126.79
## - Channel92     1      8.296 179.25 126.90
## - Channel74     1      8.432 179.38 127.06
## - Channel39     1      9.284 180.23 128.08
## - Channel79     1      9.675 180.62 128.54
## - Channel63     1     10.538 181.49 129.57
## - Channel45     1     12.602 183.55 132.00
```

```
## - Channel85   1     13.103 184.05 132.59
## - Channel59   1     14.040 184.99 133.68
## - Channel99   1     14.450 185.40 134.15
## - Channel28   1     14.898 185.85 134.67
## - Channel64   1     15.213 186.16 135.04
## - Channel56   1     15.525 186.47 135.40
## - Channel68   1     16.567 187.52 136.59
## - Channel73   1     16.766 187.72 136.82
## - Channel81   1     16.777 187.73 136.84
## - Channel51   1     17.291 188.24 137.42
## - Channel60   1     18.652 189.60 138.97
## - Channel69   1     19.057 190.01 139.43
## - Channel29   1     20.336 191.29 140.87
## - Channel1    1     22.597 193.55 143.40
## - Channel55   1     24.598 195.55 145.61
## - Channel80   1     24.734 195.68 145.76
## - Channel52   1     32.243 203.19 153.86
## - Channel54   1     35.065 206.01 156.82
##
## Step:  AIC=117.13
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel35 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel43 +
##     Channel44 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel73 + Channel74 + Channel75 +
##     Channel76 + Channel78 + Channel79 + Channel80 + Channel81 +
##     Channel83 + Channel84 + Channel85 + Channel87 + Channel88 +
##     Channel90 + Channel92 + Channel94 + Channel95 + Channel97 +
##     Channel98 + Channel99
##
##             Df Sum of Sq    RSS    AIC
## - Channel35   1     0.454 171.74 115.70
## - Channel83   1     0.469 171.75 115.72
## - Channel90   1     0.478 171.76 115.73
## - Channel17   1     0.522 171.81 115.78
## - Channel43   1     0.555 171.84 115.82
## - Channel95   1     0.561 171.84 115.83
## - Channel23   1     0.662 171.95 115.96
## - Channel3    1     0.801 172.09 116.13
## - Channel62   1     0.852 172.14 116.19
## - Channel16   1     0.874 172.16 116.22
## - Channel18   1     0.941 172.22 116.31
## - Channel44   1     0.958 172.24 116.33
## - Channel26   1     0.994 172.28 116.37
## - Channel97   1     1.104 172.39 116.51
## - Channel76   1     1.122 172.41 116.53
```

```
## - Channel10    1      1.161 172.44 116.58
## - Channel20    1      1.173 172.46 116.59
## - Channel88    1      1.356 172.64 116.82
## - Channel48    1      1.413 172.70 116.89
## - Channel6     1      1.529 172.81 117.04
## - Channel27    1      1.549 172.83 117.06
## <none>                      171.28 117.13
## - Channel19    1      1.628 172.91 117.16
## - Channel98    1      1.799 173.08 117.37
## - Channel84    1      1.804 173.09 117.38
## - Channel21    1      1.830 173.11 117.41
## - Channel65    1      1.900 173.18 117.50
## - Channel31    1      2.303 173.59 118.00
## - Channel11    1      2.346 173.63 118.05
## - Channel24    1      2.498 173.78 118.24
## - Channel75    1      2.575 173.86 118.34
## - Channel7     1      2.596 173.88 118.36
## - Channel34    1      2.681 173.97 118.47
## - Channel47    1      2.859 174.14 118.69
## + Channel72    1      0.334 170.95 118.71
## - Channel15    1      2.902 174.19 118.74
## + Channel93    1      0.274 171.01 118.78
## + Channel86    1      0.266 171.02 118.79
## - Channel8     1      2.994 174.28 118.85
## - Channel78    1      3.034 174.32 118.90
## + Channel96    1      0.150 171.13 118.94
## + Channel91    1      0.114 171.17 118.98
## + Channel77    1      0.098 171.19 119.00
## + Channel82    1      0.093 171.19 119.01
## + Channel33    1      0.093 171.19 119.01
## + Channel53    1      0.043 171.24 119.07
## + Channel58    1      0.032 171.25 119.09
## + Channel70    1      0.023 171.26 119.10
## + Channel9     1      0.015 171.27 119.11
## + Channel49    1      0.015 171.27 119.11
## + Channel38    1      0.014 171.27 119.11
## + Channel66    1      0.002 171.28 119.12
## + Channel57    1      0.002 171.28 119.12
## + Channel100   1      0.001 171.28 119.13
## + Channel89    1      0.000 171.28 119.13
## - Channel41    1      3.316 174.60 119.25
## - Channel32    1      3.423 174.71 119.38
## - Channel40    1      3.563 174.85 119.55
## - Channel4     1      3.756 175.04 119.79
## - Channel42    1      3.876 175.16 119.94
## - Channel5     1      4.064 175.35 120.17
## - Channel94    1      4.181 175.47 120.31
## - Channel46    1      4.193 175.48 120.33
## - Channel14    1      4.311 175.59 120.47
## - Channel22    1      4.936 176.22 121.24
## - Channel36    1      5.261 176.54 121.63
## - Channel37    1      5.320 176.60 121.70
## - Channel13    1      5.364 176.65 121.76
## - Channel12    1      6.886 178.17 123.60
```

```
## - Channel67    1      6.969 178.25 123.70
## - Channel50    1      7.070 178.35 123.82
## - Channel25    1      7.147 178.43 123.92
## - Channel30    1      7.183 178.47 123.96
## - Channel61    1      7.469 178.75 124.30
## - Channel2     1      7.862 179.15 124.78
## - Channel87    1      7.940 179.22 124.87
## - Channel74    1      8.179 179.46 125.16
## - Channel92    1      8.188 179.47 125.17
## - Channel39    1      8.967 180.25 126.10
## - Channel79    1      9.345 180.63 126.55
## - Channel63    1     11.789 183.07 129.44
## - Channel45    1     12.705 183.99 130.51
## - Channel85    1     12.952 184.24 130.80
## - Channel59    1     13.715 185.00 131.69
## - Channel99    1     14.882 186.17 133.04
## - Channel28    1     15.098 186.38 133.29
## - Channel56    1     15.696 186.98 133.98
## - Channel68    1     16.304 187.59 134.68
## - Channel81    1     16.462 187.75 134.86
## - Channel51    1     17.253 188.54 135.76
## - Channel64    1     17.781 189.06 136.36
## - Channel60    1     18.754 190.04 137.47
## - Channel69    1     19.620 190.90 138.44
## - Channel29    1     20.092 191.38 138.97
## - Channel71    1     21.344 192.63 140.38
## - Channel1     1     22.342 193.63 141.49
## - Channel80    1     24.415 195.70 143.78
## - Channel55    1     24.868 196.15 144.27
## - Channel73    1     29.143 200.43 148.91
## - Channel52    1     32.328 203.61 152.30
## - Channel54    1     35.342 206.63 155.46
##
## Step:  AIC=115.7
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##     Channel40 + Channel41 + Channel42 + Channel43 + Channel44 +
##     Channel45 + Channel46 + Channel47 + Channel48 + Channel50 +
##     Channel51 + Channel52 + Channel54 + Channel55 + Channel56 +
##     Channel59 + Channel60 + Channel61 + Channel62 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel73 + Channel74 + Channel75 + Channel76 +
##     Channel78 + Channel79 + Channel80 + Channel81 + Channel83 +
##     Channel84 + Channel85 + Channel87 + Channel88 + Channel90 +
##     Channel92 + Channel94 + Channel95 + Channel97 + Channel98 +
##     Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel43    1     0.367 172.10 114.16
```

```
## - Channel83    1     0.446 172.18 114.25
## - Channel90    1     0.523 172.26 114.35
## - Channel17    1     0.603 172.34 114.45
## - Channel44    1     0.724 172.46 114.60
## - Channel3     1     0.727 172.47 114.60
## - Channel18    1     0.780 172.52 114.67
## - Channel23    1     0.783 172.52 114.67
## - Channel95    1     0.892 172.63 114.81
## - Channel20    1     0.917 172.65 114.84
## - Channel16    1     0.950 172.69 114.88
## - Channel26    1     0.963 172.70 114.90
## - Channel10    1     0.991 172.73 114.93
## - Channel62    1     1.038 172.78 114.99
## - Channel76    1     1.288 173.03 115.30
## - Channel88    1     1.364 173.10 115.40
## - Channel6     1     1.477 173.22 115.54
## - Channel19    1     1.495 173.23 115.56
## - Channel97    1     1.516 173.25 115.59
## - Channel27    1     1.557 173.29 115.64
## - Channel98    1     1.566 173.30 115.65
## <none>                      171.74 115.70
## - Channel65    1     1.796 173.53 115.93
## - Channel48    1     1.878 173.62 116.03
## - Channel31    1     1.955 173.69 116.13
## - Channel84    1     2.066 173.80 116.27
## - Channel11    1     2.078 173.82 116.28
## - Channel24    1     2.407 174.15 116.69
## - Channel7     1     2.471 174.21 116.77
## - Channel21    1     2.489 174.23 116.79
## - Channel15    1     2.563 174.30 116.88
## + Channel35    1     0.454 171.28 117.13
## - Channel8     1     2.825 174.56 117.20
## - Channel78    1     2.887 174.62 117.28
## + Channel86    1     0.283 171.46 117.34
## - Channel47    1     2.965 174.70 117.38
## + Channel72    1     0.241 171.50 117.39
## + Channel93    1     0.198 171.54 117.45
## - Channel41    1     3.046 174.78 117.48
## + Channel91    1     0.093 171.65 117.58
## + Channel82    1     0.085 171.65 117.59
## + Channel77    1     0.076 171.66 117.60
## + Channel33    1     0.053 171.69 117.63
## + Channel49    1     0.045 171.69 117.64
## + Channel96    1     0.042 171.70 117.64
## + Channel53    1     0.038 171.70 117.65
## + Channel58    1     0.024 171.71 117.67
## + Channel9     1     0.012 171.73 117.68
## + Channel70    1     0.011 171.73 117.68
## + Channel38    1     0.010 171.73 117.68
## + Channel89    1     0.004 171.73 117.69
## + Channel57    1     0.004 171.73 117.69
## + Channel66    1     0.000 171.74 117.70
## + Channel100   1     0.000 171.74 117.70
## - Channel75    1     3.280 175.02 117.76
```

```
## - Channel42   1      3.468 175.21 118.00
## - Channel32   1      3.526 175.26 118.06
## - Channel4    1      3.586 175.32 118.14
## - Channel40   1      3.600 175.34 118.16
## - Channel14   1      3.893 175.63 118.52
## - Channel5    1      3.902 175.64 118.53
## - Channel46   1      4.179 175.92 118.86
## - Channel94   1      4.908 176.65 119.75
## - Channel13   1      4.920 176.66 119.77
## - Channel36   1      5.437 177.18 120.40
## - Channel37   1      5.441 177.18 120.40
## - Channel22   1      5.779 177.52 120.81
## - Channel12   1      6.442 178.18 121.61
## - Channel30   1      6.744 178.48 121.98
## - Channel25   1      6.906 178.64 122.17
## - Channel67   1      7.372 179.11 122.73
## - Channel61   1      7.689 179.43 123.11
## - Channel50   1      8.083 179.82 123.58
## - Channel2    1      8.084 179.82 123.58
## - Channel87   1      8.094 179.83 123.60
## - Channel92   1      8.486 180.22 124.07
## - Channel79   1      9.433 181.17 125.19
## - Channel39   1      9.522 181.26 125.30
## - Channel74   1      9.928 181.67 125.78
## - Channel63   1     11.913 183.65 128.12
## - Channel45   1     12.280 184.02 128.54
## - Channel59   1     13.949 185.69 130.49
## - Channel85   1     14.060 185.80 130.61
## - Channel99   1     14.506 186.24 131.13
## - Channel28   1     15.367 187.10 132.12
## - Channel34   1     16.621 188.36 133.56
## - Channel56   1     16.775 188.51 133.73
## - Channel68   1     16.902 188.64 133.88
## - Channel81   1     16.990 188.73 133.98
## - Channel64   1     18.020 189.76 135.15
## - Channel60   1     18.647 190.38 135.86
## - Channel51   1     18.747 190.49 135.97
## - Channel29   1     19.647 191.38 136.99
## - Channel69   1     20.273 192.01 137.69
## - Channel71   1     21.912 193.65 139.51
## - Channel1    1     22.442 194.18 140.10
## - Channel80   1     25.196 196.93 143.13
## - Channel55   1     25.835 197.57 143.83
## - Channel73   1     31.570 203.31 149.98
## - Channel52   1     33.692 205.43 152.21
## - Channel54   1     36.103 207.84 154.72
##
## Step:  AIC=114.15
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##      Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##      Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##      Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##      Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
```

```
##       Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##       Channel40 + Channel41 + Channel42 + Channel44 + Channel45 +
##       Channel46 + Channel47 + Channel48 + Channel50 + Channel51 +
##       Channel52 + Channel54 + Channel55 + Channel56 + Channel59 +
##       Channel60 + Channel61 + Channel62 + Channel63 + Channel64 +
##       Channel65 + Channel67 + Channel68 + Channel69 + Channel71 +
##       Channel73 + Channel74 + Channel75 + Channel76 + Channel78 +
##       Channel79 + Channel80 + Channel81 + Channel83 + Channel84 +
##       Channel85 + Channel87 + Channel88 + Channel90 + Channel92 +
##       Channel94 + Channel95 + Channel97 + Channel98 + Channel99
##
##               Df Sum of Sq    RSS    AIC
## - Channel44    1     0.369 172.47 112.61
## - Channel83    1     0.458 172.56 112.73
## - Channel90    1     0.513 172.62 112.80
## - Channel3     1     0.590 172.69 112.89
## - Channel23    1     0.794 172.90 113.14
## - Channel17    1     0.798 172.90 113.15
## - Channel20    1     0.807 172.91 113.16
## - Channel18    1     0.832 172.94 113.19
## - Channel26    1     0.914 173.02 113.29
## - Channel16    1     0.963 173.07 113.36
## - Channel62    1     1.029 173.13 113.44
## - Channel10    1     1.138 173.24 113.57
## - Channel95    1     1.152 173.26 113.59
## - Channel76    1     1.215 173.32 113.67
## - Channel19    1     1.281 173.39 113.75
## - Channel88    1     1.313 173.42 113.79
## - Channel6     1     1.320 173.43 113.80
## - Channel27    1     1.488 173.59 114.01
## - Channel97    1     1.574 173.68 114.11
## <none>                     172.10 114.16
## - Channel65    1     1.633 173.74 114.19
## - Channel98    1     1.739 173.84 114.32
## - Channel48    1     1.882 173.99 114.49
## - Channel84    1     1.967 174.07 114.60
## - Channel31    1     1.971 174.08 114.60
## - Channel11    1     2.320 174.43 115.03
## - Channel7     1     2.338 174.44 115.06
## - Channel24    1     2.394 174.50 115.12
## - Channel21    1     2.691 174.80 115.49
## - Channel47    1     2.767 174.87 115.58
## - Channel78    1     2.849 174.95 115.69
## + Channel43    1     0.367 171.74 115.70
## - Channel8     1     2.870 174.97 115.71
## - Channel15    1     2.876 174.98 115.72
## + Channel35    1     0.266 171.84 115.82
## + Channel93    1     0.203 171.90 115.90
## - Channel41    1     3.041 175.15 115.92
## + Channel72    1     0.157 171.95 115.96
## + Channel86    1     0.141 171.96 115.98
## + Channel77    1     0.132 171.97 115.99
## - Channel75    1     3.143 175.25 116.05
## + Channel82    1     0.082 172.02 116.05
```

```
## + Channel96    1      0.073 172.03 116.06
## + Channel33    1      0.070 172.03 116.07
## + Channel53    1      0.050 172.06 116.09
## + Channel70    1      0.050 172.06 116.09
## + Channel38    1      0.049 172.06 116.09
## + Channel58    1      0.026 172.08 116.12
## + Channel91    1      0.022 172.08 116.13
## + Channel49    1      0.020 172.09 116.13
## + Channel9     1      0.011 172.09 116.14
## + Channel100   1      0.002 172.10 116.15
## + Channel66    1      0.001 172.10 116.15
## + Channel89    1      0.001 172.10 116.15
## + Channel57    1      0.000 172.10 116.15
## - Channel40    1      3.256 175.36 116.19
## - Channel4     1      3.291 175.40 116.23
## - Channel32    1      3.626 175.73 116.64
## - Channel5     1      3.641 175.75 116.66
## - Channel14    1      4.237 176.34 117.38
## - Channel46    1      4.552 176.66 117.77
## - Channel13    1      5.175 177.28 118.52
## - Channel94    1      5.327 177.43 118.71
## - Channel36    1      5.344 177.45 118.73
## - Channel37    1      5.413 177.52 118.81
## - Channel22    1      6.007 178.11 119.53
## - Channel12    1      6.719 178.82 120.39
## - Channel25    1      6.723 178.83 120.39
## - Channel30    1      6.773 178.88 120.45
## - Channel42    1      7.550 179.66 121.39
## - Channel87    1      7.998 180.10 121.92
## - Channel67    1      8.033 180.14 121.96
## - Channel61    1      8.194 180.30 122.16
## - Channel50    1      8.545 180.65 122.57
## - Channel92    1      8.591 180.70 122.63
## - Channel2     1      9.004 181.11 123.12
## - Channel39    1      9.156 181.26 123.30
## - Channel79    1      9.261 181.37 123.42
## - Channel74    1      9.845 181.95 124.11
## - Channel45    1     11.914 184.02 126.55
## - Channel63    1     12.116 184.22 126.78
## - Channel85    1     13.795 185.90 128.73
## - Channel99    1     15.368 187.47 130.54
## - Channel28    1     15.403 187.51 130.58
## - Channel59    1     15.677 187.78 130.90
## - Channel81    1     16.644 188.75 132.00
## - Channel34    1     16.662 188.77 132.02
## - Channel56    1     17.254 189.36 132.70
## - Channel64    1     17.830 189.93 133.35
## - Channel68    1     18.029 190.13 133.57
## - Channel51    1     19.502 191.61 135.23
## - Channel29    1     19.942 192.05 135.73
## - Channel60    1     20.757 192.86 136.64
## - Channel69    1     21.195 193.30 137.12
## - Channel71    1     22.271 194.38 138.32
## - Channel80    1     24.840 196.94 141.14
```

```
## - Channel1      1     25.186 197.29 141.52
## - Channel55     1     26.060 198.16 142.47
## - Channel73     1     31.502 203.61 148.29
## - Channel52     1     34.293 206.40 151.22
## - Channel54     1     36.180 208.28 153.18
##
## Step:  AIC=112.62
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##      Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##      Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##      Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##      Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##      Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##      Channel40 + Channel41 + Channel42 + Channel45 + Channel46 +
##      Channel47 + Channel48 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel67 + Channel68 + Channel69 + Channel71 + Channel73 +
##      Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##      Channel80 + Channel81 + Channel83 + Channel84 + Channel85 +
##      Channel87 + Channel88 + Channel90 + Channel92 + Channel94 +
##      Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel90   1     0.443 172.92 111.17
## - Channel83   1     0.534 173.01 111.28
## - Channel3    1     0.563 173.04 111.32
## - Channel23   1     0.709 173.18 111.50
## - Channel20   1     0.722 173.19 111.51
## - Channel18   1     0.826 173.30 111.64
## - Channel26   1     0.923 173.40 111.76
## - Channel17   1     0.934 173.41 111.78
## - Channel62   1     0.991 173.46 111.85
## - Channel16   1     1.000 173.47 111.86
## - Channel10   1     1.145 173.62 112.04
## - Channel19   1     1.226 173.70 112.14
## - Channel95   1     1.233 173.71 112.15
## - Channel6    1     1.237 173.71 112.15
## - Channel76   1     1.323 173.80 112.26
## - Channel27   1     1.378 173.85 112.33
## - Channel88   1     1.458 173.93 112.42
## - Channel97   1     1.552 174.03 112.54
## - Channel65   1     1.611 174.08 112.61
## <none>                     172.47 112.61
## - Channel31   1     1.738 174.21 112.77
## - Channel98   1     1.756 174.23 112.79
## - Channel48   1     1.818 174.29 112.87
## - Channel84   1     1.849 174.32 112.91
## - Channel11   1     2.193 174.67 113.33
## - Channel7    1     2.284 174.76 113.44
## - Channel24   1     2.441 174.91 113.64
## - Channel47   1     2.586 175.06 113.81
## - Channel21   1     2.698 175.17 113.95
```

```
## + Channel44     1      0.369 172.10 114.16
## - Channel8      1      2.895 175.37 114.19
## + Channel35     1      0.228 172.25 114.33
## - Channel75     1      3.009 175.48 114.33
## - Channel78     1      3.017 175.49 114.34
## + Channel72     1      0.208 172.27 114.36
## + Channel77     1      0.181 172.29 114.39
## - Channel15     1      3.056 175.53 114.39
## + Channel86     1      0.174 172.30 114.40
## + Channel93     1      0.161 172.31 114.42
## - Channel4      1      3.114 175.59 114.46
## + Channel33     1      0.103 172.37 114.49
## + Channel38     1      0.069 172.40 114.53
## + Channel70     1      0.060 172.41 114.54
## + Channel53     1      0.055 172.42 114.55
## + Channel58     1      0.046 172.43 114.56
## + Channel49     1      0.033 172.44 114.57
## + Channel96     1      0.029 172.44 114.58
## + Channel82     1      0.027 172.45 114.58
## + Channel91     1      0.024 172.45 114.58
## + Channel57     1      0.015 172.46 114.60
## + Channel89     1      0.012 172.46 114.60
## + Channel43     1      0.011 172.46 114.60
## + Channel66     1      0.005 172.47 114.61
## + Channel100    1      0.001 172.47 114.61
## + Channel9      1      0.000 172.47 114.61
## - Channel32     1      3.322 175.80 114.72
## - Channel5      1      3.474 175.95 114.90
## - Channel40     1      4.126 176.60 115.70
## - Channel46     1      4.225 176.70 115.82
## - Channel14     1      4.256 176.73 115.86
## - Channel41     1      4.372 176.84 116.00
## - Channel13     1      5.111 177.58 116.89
## - Channel36     1      5.140 177.61 116.93
## - Channel37     1      5.347 177.82 117.18
## - Channel94     1      5.547 178.02 117.42
## - Channel22     1      5.799 178.27 117.72
## - Channel30     1      6.492 178.97 118.56
## - Channel12     1      6.585 179.06 118.67
## - Channel25     1      6.639 179.11 118.74
## - Channel61     1      8.153 180.63 120.55
## - Channel67     1      8.252 180.73 120.66
## - Channel92     1      8.409 180.88 120.85
## - Channel87     1      8.948 181.42 121.49
## - Channel2      1      9.103 181.58 121.67
## - Channel50     1      9.450 181.92 122.08
## - Channel74     1      9.615 182.09 122.28
## - Channel39     1     10.163 182.64 122.92
## - Channel79     1     10.488 182.96 123.31
## - Channel63     1     11.818 184.29 124.86
## - Channel42     1     13.784 186.26 127.14
## - Channel85     1     14.028 186.50 127.43
## - Channel28     1     15.120 187.59 128.68
## - Channel99     1     15.377 187.85 128.98
```

```
## - Channel59    1    15.426 187.90 129.03
## - Channel34    1    16.312 188.78 130.04
## - Channel56    1    16.937 189.41 130.75
## - Channel64    1    17.569 190.04 131.47
## - Channel81    1    17.848 190.32 131.79
## - Channel68    1    17.911 190.38 131.86
## - Channel29    1    19.694 192.17 133.86
## - Channel60    1    20.389 192.86 134.64
## - Channel51    1    20.827 193.30 135.12
## - Channel69    1    21.044 193.52 135.37
## - Channel71    1    22.025 194.50 136.45
## - Channel55    1    25.737 198.21 140.52
## - Channel1     1    25.978 198.45 140.78
## - Channel80    1    27.322 199.80 142.23
## - Channel45    1    28.425 200.90 143.41
## - Channel73    1    31.135 203.61 146.30
## - Channel52    1    34.866 207.34 150.20
## - Channel54    1    35.836 208.31 151.20
##
## Step:  AIC=111.17
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##      Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##      Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##      Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##      Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##      Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##      Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##      Channel40 + Channel41 + Channel42 + Channel45 + Channel46 +
##      Channel47 + Channel48 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel67 + Channel68 + Channel69 + Channel71 + Channel73 +
##      Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##      Channel80 + Channel81 + Channel83 + Channel84 + Channel85 +
##      Channel87 + Channel88 + Channel92 + Channel94 + Channel95 +
##      Channel97 + Channel98 + Channel99
##
##                Df Sum of Sq    RSS    AIC
## - Channel83    1     0.464 173.38 109.74
## - Channel23    1     0.599 173.51 109.91
## - Channel3     1     0.627 173.54 109.94
## - Channel62    1     0.786 173.70 110.14
## - Channel26    1     0.793 173.71 110.15
## - Channel95    1     0.853 173.77 110.22
## - Channel20    1     0.854 173.77 110.22
## - Channel17    1     1.054 173.97 110.47
## - Channel10    1     1.086 174.00 110.51
## - Channel19    1     1.131 174.05 110.57
## - Channel18    1     1.192 174.11 110.64
## - Channel88    1     1.247 174.16 110.71
## - Channel97    1     1.334 174.25 110.82
## - Channel6     1     1.335 174.25 110.82
## - Channel16    1     1.419 174.34 110.92
## - Channel27    1     1.522 174.44 111.05
```

```
## - Channel65    1      1.566 174.48 111.11
## <none>                       172.92 111.17
## - Channel84    1      1.620 174.54 111.17
## - Channel48    1      1.704 174.62 111.28
## - Channel31    1      1.745 174.66 111.33
## - Channel98    1      1.798 174.71 111.39
## - Channel76    1      1.922 174.84 111.54
## - Channel11    1      2.073 174.99 111.73
## - Channel21    1      2.450 175.37 112.19
## - Channel24    1      2.542 175.46 112.30
## - Channel7     1      2.664 175.58 112.45
## + Channel90    1      0.443 172.47 112.61
## - Channel15    1      2.834 175.75 112.66
## + Channel44    1      0.298 172.62 112.80
## + Channel35    1      0.262 172.66 112.84
## + Channel91    1      0.252 172.66 112.85
## + Channel89    1      0.211 172.71 112.91
## + Channel33    1      0.184 172.73 112.94
## + Channel72    1      0.172 172.74 112.95
## + Channel77    1      0.160 172.76 112.97
## - Channel8     1      3.113 176.03 113.00
## + Channel38    1      0.130 172.79 113.00
## + Channel66    1      0.075 172.84 113.07
## - Channel47    1      3.191 176.11 113.10
## + Channel82    1      0.053 172.86 113.10
## + Channel86    1      0.044 172.87 113.11
## + Channel96    1      0.039 172.88 113.12
## + Channel70    1      0.033 172.88 113.13
## + Channel100   1      0.026 172.89 113.14
## + Channel58    1      0.023 172.89 113.14
## + Channel53    1      0.023 172.89 113.14
## + Channel57    1      0.019 172.90 113.14
## + Channel49    1      0.007 172.91 113.16
## + Channel9     1      0.006 172.91 113.16
## + Channel43    1      0.004 172.91 113.16
## + Channel93    1      0.002 172.91 113.16
## - Channel4     1      3.300 176.22 113.23
## - Channel75    1      3.312 176.23 113.25
## - Channel78    1      3.314 176.23 113.25
## - Channel32    1      3.411 176.33 113.37
## - Channel5     1      3.583 176.50 113.58
## - Channel46    1      3.836 176.75 113.88
## - Channel40    1      3.945 176.86 114.02
## - Channel14    1      4.185 177.10 114.31
## - Channel41    1      4.244 177.16 114.38
## - Channel13    1      5.096 178.01 115.41
## - Channel22    1      5.460 178.38 115.85
## - Channel94    1      5.473 178.39 115.87
## - Channel36    1      5.476 178.39 115.87
## - Channel37    1      5.511 178.43 115.91
## - Channel30    1      6.464 179.38 117.06
## - Channel12    1      6.539 179.46 117.15
## - Channel25    1      6.547 179.46 117.16
## - Channel61    1      7.768 180.68 118.61
```

```
## - Channel67    1        8.496 181.41 119.48
## - Channel50    1        9.007 181.92 120.08
## - Channel2     1        9.160 182.08 120.27
## - Channel74    1        9.261 182.18 120.38
## - Channel39    1        9.914 182.83 121.15
## - Channel79    1       10.564 183.48 121.92
## - Channel87    1       11.125 184.04 122.57
## - Channel63    1       11.923 184.84 123.50
## - Channel42    1       13.630 186.55 125.48
## - Channel85    1       14.043 186.96 125.95
## - Channel99    1       15.454 188.37 127.57
## - Channel28    1       15.567 188.48 127.70
## - Channel59    1       15.596 188.51 127.73
## - Channel92    1       16.503 189.42 128.76
## - Channel34    1       16.659 189.57 128.94
## - Channel64    1       17.248 190.16 129.61
## - Channel56    1       17.413 190.33 129.80
## - Channel81    1       17.422 190.34 129.81
## - Channel68    1       18.927 191.84 131.50
## - Channel29    1       20.008 192.92 132.71
## - Channel60    1       20.108 193.02 132.82
## - Channel51    1       20.481 193.40 133.23
## - Channel69    1       23.199 196.12 136.23
## - Channel55    1       25.899 198.81 139.17
## - Channel1     1       26.479 199.40 139.80
## - Channel80    1       26.898 199.81 140.25
## - Channel45    1       28.007 200.92 141.44
## - Channel71    1       28.982 201.90 142.48
## - Channel73    1       31.851 204.77 145.51
## - Channel52    1       34.572 207.49 148.35
## - Channel54    1       35.568 208.48 149.38
##
## Step:  AIC=109.74
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel3 + Channel4 +
##     Channel5 + Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##     Channel40 + Channel41 + Channel42 + Channel45 + Channel46 +
##     Channel47 + Channel48 + Channel50 + Channel51 + Channel52 +
##     Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##     Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##     Channel67 + Channel68 + Channel69 + Channel71 + Channel73 +
##     Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##     Channel80 + Channel81 + Channel84 + Channel85 + Channel87 +
##     Channel88 + Channel92 + Channel94 + Channel95 + Channel97 +
##     Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel3    1        0.450 173.83 108.30
## - Channel23   1        0.464 173.84 108.32
## - Channel26   1        0.695 174.07 108.60
```

```
## - Channel95    1      0.772 174.15 108.70
## - Channel62    1      0.811 174.19 108.75
## - Channel10    1      0.890 174.27 108.84
## - Channel17    1      1.049 174.43 109.04
## - Channel18    1      1.113 174.49 109.12
## - Channel20    1      1.181 174.56 109.20
## - Channel6     1      1.188 174.57 109.21
## - Channel16    1      1.310 174.69 109.36
## - Channel97    1      1.427 174.81 109.50
## - Channel19    1      1.446 174.83 109.53
## - Channel27    1      1.522 174.90 109.62
## - Channel76    1      1.578 174.96 109.69
## - Channel48    1      1.601 174.98 109.72
## <none>                      173.38 109.74
## - Channel88    1      1.654 175.03 109.78
## - Channel31    1      1.692 175.07 109.83
## - Channel98    1      1.731 175.11 109.88
## - Channel65    1      1.811 175.19 109.98
## - Channel11    1      1.901 175.28 110.09
## - Channel21    1      2.093 175.47 110.32
## - Channel7     1      2.542 175.92 110.87
## + Channel83    1      0.464 172.92 111.17
## + Channel90    1      0.372 173.01 111.28
## + Channel44    1      0.367 173.01 111.29
## - Channel15    1      2.886 176.27 111.29
## - Channel24    1      2.935 176.31 111.35
## - Channel75    1      3.003 176.38 111.44
## - Channel4     1      3.015 176.40 111.45
## + Channel35    1      0.236 173.14 111.45
## + Channel77    1      0.236 173.14 111.45
## + Channel91    1      0.236 173.14 111.45
## + Channel33    1      0.228 173.15 111.46
## + Channel66    1      0.181 173.20 111.52
## + Channel38    1      0.168 173.21 111.53
## - Channel47    1      3.095 176.47 111.55
## + Channel82    1      0.124 173.26 111.59
## + Channel72    1      0.122 173.26 111.59
## + Channel57    1      0.097 173.28 111.62
## + Channel89    1      0.088 173.29 111.63
## + Channel58    1      0.067 173.31 111.66
## + Channel9     1      0.038 173.34 111.69
## + Channel70    1      0.034 173.35 111.70
## + Channel86    1      0.024 173.36 111.71
## + Channel53    1      0.023 173.36 111.71
## + Channel100   1      0.022 173.36 111.72
## + Channel49    1      0.011 173.37 111.73
## + Channel43    1      0.011 173.37 111.73
## + Channel96    1      0.010 173.37 111.73
## + Channel93    1      0.006 173.37 111.73
## - Channel8     1      3.274 176.65 111.77
## - Channel5     1      3.310 176.69 111.81
## - Channel32    1      3.409 176.79 111.93
## - Channel46    1      3.653 177.03 112.22
## - Channel40    1      4.015 177.40 112.67
```

```
## - Channel41   1      4.092 177.47 112.76
## - Channel14   1      4.161 177.54 112.84
## - Channel22   1      5.042 178.42 113.91
## - Channel37   1      5.254 178.63 114.16
## - Channel13   1      5.276 178.66 114.19
## - Channel94   1      5.292 178.67 114.21
## - Channel36   1      5.340 178.72 114.26
## - Channel78   1      5.668 179.05 114.66
## - Channel30   1      6.351 179.73 115.48
## - Channel12   1      6.630 180.01 115.81
## - Channel25   1      6.908 180.29 116.14
## - Channel61   1      8.262 181.64 117.75
## - Channel50   1      8.836 182.22 118.43
## - Channel74   1      9.159 182.54 118.81
## - Channel67   1      9.206 182.59 118.87
## - Channel39   1      9.979 183.36 119.77
## - Channel2    1     10.318 183.70 120.17
## - Channel79   1     12.020 185.40 122.15
## - Channel63   1     12.477 185.86 122.68
## - Channel42   1     13.175 186.56 123.49
## - Channel87   1     13.863 187.24 124.28
## - Channel84   1     14.713 188.09 125.25
## - Channel59   1     15.139 188.52 125.74
## - Channel28   1     15.419 188.80 126.06
## - Channel99   1     15.510 188.89 126.16
## - Channel92   1     16.682 190.06 127.49
## - Channel34   1     16.795 190.18 127.62
## - Channel56   1     17.199 190.58 128.08
## - Channel64   1     18.951 192.33 130.04
## - Channel60   1     19.946 193.33 131.16
## - Channel29   1     20.001 193.38 131.22
## - Channel51   1     20.108 193.49 131.33
## - Channel68   1     20.351 193.73 131.60
## - Channel69   1     25.637 199.02 137.39
## - Channel55   1     25.943 199.32 137.72
## - Channel81   1     26.560 199.94 138.39
## - Channel1    1     26.913 200.29 138.77
## - Channel45   1     27.599 200.98 139.50
## - Channel80   1     27.817 201.20 139.73
## - Channel85   1     28.374 201.75 140.33
## - Channel73   1     32.575 205.96 144.76
## - Channel71   1     32.732 206.11 144.92
## - Channel52   1     34.175 207.56 146.42
## - Channel54   1     35.939 209.32 148.24
##
## Step:  AIC=108.3
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel23 + Channel24 + Channel25 + Channel26 +
##     Channel27 + Channel28 + Channel29 + Channel30 + Channel31 +
##     Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##     Channel40 + Channel41 + Channel42 + Channel45 + Channel46 +
```

```
##      Channel47 + Channel48 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel62 + Channel63 + Channel64 + Channel65 +
##      Channel67 + Channel68 + Channel69 + Channel71 + Channel73 +
##      Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##      Channel80 + Channel81 + Channel84 + Channel85 + Channel87 +
##      Channel88 + Channel92 + Channel94 + Channel95 + Channel97 +
##      Channel98 + Channel99
##
##             Df Sum of Sq    RSS    AIC
## - Channel23   1     0.439 174.27 106.84
## - Channel6    1     0.751 174.58 107.23
## - Channel95   1     0.798 174.63 107.28
## - Channel26   1     0.803 174.63 107.29
## - Channel10   1     0.816 174.65 107.31
## - Channel62   1     0.893 174.72 107.40
## - Channel18   1     1.027 174.86 107.56
## - Channel17   1     1.116 174.95 107.67
## - Channel16   1     1.231 175.06 107.82
## - Channel20   1     1.253 175.08 107.84
## - Channel97   1     1.381 175.21 108.00
## - Channel27   1     1.396 175.22 108.02
## - Channel48   1     1.499 175.33 108.14
## - Channel19   1     1.565 175.40 108.23
## - Channel88   1     1.597 175.43 108.27
## <none>                    173.83 108.30
## - Channel76   1     1.640 175.47 108.32
## - Channel98   1     1.776 175.61 108.48
## - Channel11   1     1.777 175.61 108.49
## - Channel31   1     1.793 175.62 108.50
## - Channel65   1     1.940 175.77 108.69
## - Channel21   1     2.066 175.90 108.84
## - Channel7    1     2.093 175.92 108.87
## - Channel15   1     2.764 176.59 109.69
## + Channel3    1     0.450 173.38 109.74
## + Channel90   1     0.436 173.39 109.76
## - Channel47   1     2.841 176.67 109.78
## - Channel8    1     2.904 176.73 109.86
## + Channel44   1     0.324 173.51 109.90
## + Channel83   1     0.286 173.54 109.94
## - Channel75   1     2.978 176.81 109.95
## + Channel91   1     0.240 173.59 110.00
## + Channel77   1     0.234 173.59 110.01
## + Channel35   1     0.225 173.60 110.02
## - Channel24   1     3.083 176.91 110.08
## + Channel66   1     0.175 173.65 110.08
## + Channel57   1     0.155 173.68 110.11
## + Channel33   1     0.145 173.68 110.12
## + Channel72   1     0.143 173.69 110.12
## + Channel38   1     0.118 173.71 110.15
## + Channel89   1     0.111 173.72 110.16
## + Channel58   1     0.104 173.73 110.17
## + Channel53   1     0.068 173.76 110.21
## + Channel82   1     0.054 173.78 110.23
```

```
## + Channel70    1     0.034 173.80 110.26
## - Channel5     1     3.237 177.07 110.27
## + Channel86    1     0.024 173.81 110.27
## + Channel43    1     0.021 173.81 110.27
## + Channel93    1     0.018 173.81 110.28
## + Channel49    1     0.016 173.81 110.28
## + Channel9     1     0.010 173.82 110.29
## + Channel100   1     0.010 173.82 110.29
## + Channel96    1     0.003 173.83 110.30
## - Channel32    1     3.595 177.43 110.70
## - Channel40    1     3.638 177.47 110.75
## - Channel41    1     3.704 177.53 110.83
## - Channel14    1     3.898 177.73 111.07
## - Channel46    1     3.968 177.80 111.15
## - Channel4     1     4.148 177.98 111.37
## - Channel22    1     4.993 178.82 112.39
## - Channel13    1     5.079 178.91 112.49
## - Channel37    1     5.235 179.06 112.68
## - Channel78    1     5.394 179.22 112.87
## - Channel94    1     5.418 179.25 112.90
## - Channel36    1     5.582 179.41 113.09
## - Channel12    1     6.457 180.29 114.14
## - Channel30    1     6.460 180.29 114.14
## - Channel25    1     7.403 181.23 115.27
## - Channel61    1     8.545 182.37 116.62
## - Channel67    1     8.931 182.76 117.07
## - Channel50    1     8.990 182.82 117.14
## - Channel74    1     9.120 182.95 117.29
## - Channel39    1     9.559 183.39 117.81
## - Channel79    1    11.804 185.63 120.42
## - Channel63    1    12.443 186.27 121.16
## - Channel42    1    12.726 186.56 121.49
## - Channel87    1    13.645 187.47 122.55
## - Channel84    1    14.469 188.30 123.49
## - Channel59    1    14.740 188.57 123.80
## - Channel28    1    15.021 188.85 124.12
## - Channel99    1    15.559 189.39 124.73
## - Channel92    1    16.829 190.66 126.17
## - Channel56    1    16.984 190.81 126.34
## - Channel34    1    17.399 191.23 126.81
## - Channel2     1    19.050 192.88 128.66
## - Channel64    1    19.243 193.07 128.87
## - Channel60    1    19.718 193.55 129.40
## - Channel29    1    19.815 193.65 129.51
## - Channel68    1    19.901 193.73 129.60
## - Channel51    1    20.711 194.54 130.50
## - Channel69    1    25.224 199.05 135.43
## - Channel55    1    25.862 199.69 136.12
## - Channel81    1    27.139 200.97 137.49
## - Channel1     1    27.405 201.23 137.77
## - Channel45    1    27.937 201.77 138.34
## - Channel80    1    27.965 201.79 138.37
## - Channel85    1    27.966 201.80 138.37
## - Channel71    1    32.283 206.11 142.92
```

```
## - Channel73    1    32.346 206.18 142.99
## - Channel52    1    35.176 209.00 145.92
## - Channel54    1    36.117 209.95 146.89
##
## Step:  AIC=106.84
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel6 + Channel7 + Channel8 + Channel10 + Channel11 +
##     Channel12 + Channel13 + Channel14 + Channel15 + Channel16 +
##     Channel17 + Channel18 + Channel19 + Channel20 + Channel21 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel27 +
##     Channel28 + Channel29 + Channel30 + Channel31 + Channel32 +
##     Channel34 + Channel36 + Channel37 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel45 + Channel46 + Channel47 +
##     Channel48 + Channel50 + Channel51 + Channel52 + Channel54 +
##     Channel55 + Channel56 + Channel59 + Channel60 + Channel61 +
##     Channel62 + Channel63 + Channel64 + Channel65 + Channel67 +
##     Channel68 + Channel69 + Channel71 + Channel73 + Channel74 +
##     Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel84 + Channel85 + Channel87 + Channel88 +
##     Channel92 + Channel94 + Channel95 + Channel97 + Channel98 +
##     Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel6    1     0.675 174.94 105.67
## - Channel10   1     0.695 174.96 105.70
## - Channel62   1     0.754 175.02 105.77
## - Channel95   1     0.917 175.19 105.97
## - Channel26   1     1.013 175.28 106.09
## - Channel18   1     1.037 175.31 106.12
## - Channel17   1     1.107 175.38 106.20
## - Channel16   1     1.172 175.44 106.28
## - Channel97   1     1.260 175.53 106.39
## - Channel27   1     1.328 175.60 106.47
## - Channel48   1     1.465 175.73 106.64
## <none>                     174.27 106.84
## - Channel31   1     1.667 175.94 106.89
## - Channel88   1     1.673 175.94 106.90
## - Channel65   1     1.812 176.08 107.07
## - Channel76   1     1.831 176.10 107.09
## - Channel21   1     1.843 176.11 107.10
## - Channel11   1     1.863 176.13 107.13
## - Channel19   1     1.871 176.14 107.14
## - Channel7    1     2.094 176.36 107.41
## - Channel98   1     2.257 176.53 107.61
## - Channel20   1     2.334 176.60 107.70
## - Channel15   1     2.790 177.06 108.26
## + Channel23   1     0.439 173.83 108.30
## + Channel3    1     0.425 173.84 108.32
## + Channel90   1     0.348 173.92 108.41
## - Channel75   1     2.966 177.24 108.47
## + Channel35   1     0.291 173.98 108.48
## + Channel44   1     0.258 174.01 108.52
## - Channel5    1     3.014 177.28 108.53
## + Channel91   1     0.243 174.03 108.54
```

64

```
## + Channel66    1      0.238 174.03 108.55
## - Channel8     1      3.043 177.31 108.56
## + Channel83    1      0.192 174.08 108.61
## + Channel38    1      0.176 174.09 108.62
## + Channel53    1      0.160 174.11 108.64
## + Channel77    1      0.158 174.11 108.65
## + Channel57    1      0.140 174.13 108.67
## + Channel33    1      0.131 174.14 108.68
## + Channel72    1      0.108 174.16 108.71
## + Channel86    1      0.066 174.20 108.76
## + Channel89    1      0.058 174.21 108.77
## + Channel58    1      0.038 174.23 108.80
## + Channel82    1      0.036 174.23 108.80
## + Channel96    1      0.028 174.24 108.81
## + Channel100   1      0.020 174.25 108.82
## + Channel93    1      0.019 174.25 108.82
## + Channel49    1      0.018 174.25 108.82
## + Channel70    1      0.010 174.26 108.83
## + Channel43    1      0.008 174.26 108.83
## + Channel9     1      0.005 174.26 108.83
## - Channel47    1      3.280 177.55 108.85
## - Channel32    1      3.456 177.72 109.06
## - Channel46    1      3.636 177.91 109.28
## - Channel40    1      3.892 178.16 109.59
## - Channel14    1      3.895 178.16 109.59
## - Channel41    1      3.972 178.24 109.69
## - Channel4     1      4.009 178.28 109.73
## - Channel13    1      5.097 179.37 111.04
## - Channel78    1      5.330 179.60 111.32
## - Channel37    1      5.621 179.89 111.67
## - Channel94    1      5.812 180.08 111.89
## - Channel36    1      5.845 180.11 111.93
## - Channel30    1      6.419 180.69 112.62
## - Channel12    1      6.606 180.88 112.84
## - Channel74    1      8.965 183.23 115.63
## - Channel50    1      9.152 183.42 115.85
## - Channel61    1      9.375 183.64 116.11
## - Channel67    1      9.904 184.17 116.73
## - Channel39    1     10.056 184.32 116.90
## - Channel79    1     11.684 185.95 118.79
## - Channel25    1     12.242 186.51 119.44
## - Channel63    1     13.166 187.44 120.50
## - Channel42    1     13.237 187.51 120.58
## - Channel87    1     13.778 188.05 121.20
## - Channel84    1     14.046 188.31 121.51
## - Channel28    1     15.126 189.40 122.74
## - Channel22    1     15.197 189.47 122.82
## - Channel59    1     16.340 190.61 124.11
## - Channel92    1     17.284 191.55 125.17
## - Channel99    1     17.603 191.87 125.53
## - Channel34    1     17.653 191.92 125.59
## - Channel24    1     18.132 192.40 126.12
## - Channel64    1     19.061 193.33 127.16
## - Channel2     1     19.143 193.41 127.25
```

```
## - Channel29    1     20.274 194.54 128.50
## - Channel56    1     20.805 195.07 129.09
## - Channel51    1     21.407 195.68 129.75
## - Channel68    1     21.626 195.90 129.99
## - Channel60    1     21.729 196.00 130.11
## - Channel69    1     26.408 200.68 135.18
## - Channel81    1     26.704 200.97 135.49
## - Channel1     1     27.335 201.60 136.17
## - Channel45    1     27.557 201.83 136.41
## - Channel85    1     27.590 201.86 136.44
## - Channel80    1     27.623 201.89 136.47
## - Channel55    1     30.017 204.29 139.01
## - Channel73    1     33.080 207.35 142.21
## - Channel71    1     33.469 207.74 142.61
## - Channel52    1     36.830 211.10 146.06
## - Channel54    1     40.017 214.29 149.28
##
## Step:  AIC=105.67
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel10 + Channel11 + Channel12 +
##     Channel13 + Channel14 + Channel15 + Channel16 + Channel17 +
##     Channel18 + Channel19 + Channel20 + Channel21 + Channel22 +
##     Channel24 + Channel25 + Channel26 + Channel27 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel62 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel73 + Channel74 + Channel75 +
##     Channel76 + Channel78 + Channel79 + Channel80 + Channel81 +
##     Channel84 + Channel85 + Channel87 + Channel88 + Channel92 +
##     Channel94 + Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel62   1     0.687 175.63 104.52
## - Channel10   1     0.738 175.68 104.58
## - Channel18   1     0.790 175.73 104.64
## - Channel95   1     0.916 175.86 104.80
## - Channel16   1     1.049 175.99 104.96
## - Channel17   1     1.144 176.09 105.07
## - Channel97   1     1.187 176.13 105.13
## - Channel27   1     1.215 176.16 105.16
## - Channel26   1     1.271 176.22 105.23
## <none>                    174.94 105.67
## - Channel11   1     1.653 176.60 105.69
## - Channel48   1     1.702 176.65 105.75
## - Channel65   1     1.761 176.71 105.83
## - Channel88   1     1.784 176.73 105.85
## - Channel19   1     1.851 176.79 105.94
## - Channel76   1     1.860 176.80 105.95
## - Channel31   1     1.942 176.88 106.05
## - Channel21   1     1.949 176.89 106.06
## - Channel20   1     2.083 177.03 106.22
```

```
## - Channel98    1      2.212 177.16 106.37
## - Channel7     1      2.213 177.16 106.38
## - Channel8     1      2.371 177.31 106.57
## + Channel6     1      0.675 174.27 106.84
## + Channel90    1      0.388 174.56 107.19
## - Channel15    1      2.902 177.85 107.21
## + Channel23    1      0.363 174.58 107.23
## + Channel35    1      0.302 174.64 107.30
## + Channel38    1      0.242 174.70 107.38
## - Channel75    1      3.044 177.99 107.38
## + Channel77    1      0.234 174.71 107.39
## + Channel53    1      0.218 174.72 107.40
## + Channel44    1      0.215 174.73 107.41
## + Channel66    1      0.209 174.74 107.42
## + Channel83    1      0.200 174.74 107.43
## + Channel91    1      0.183 174.76 107.45
## + Channel33    1      0.125 174.82 107.52
## + Channel96    1      0.114 174.83 107.53
## + Channel89    1      0.102 174.84 107.55
## + Channel57    1      0.096 174.85 107.56
## + Channel72    1      0.094 174.85 107.56
## - Channel47    1      3.194 178.14 107.56
## + Channel86    1      0.062 174.88 107.60
## + Channel9     1      0.052 174.89 107.61
## + Channel49    1      0.048 174.90 107.61
## + Channel100   1      0.046 174.90 107.62
## + Channel82    1      0.030 174.91 107.64
## + Channel3     1      0.015 174.93 107.65
## + Channel93    1      0.009 174.93 107.66
## + Channel58    1      0.007 174.94 107.66
## + Channel43    1      0.007 174.94 107.66
## + Channel70    1      0.002 174.94 107.67
## - Channel14    1      3.682 178.62 108.15
## - Channel32    1      3.858 178.80 108.36
## - Channel41    1      4.088 179.03 108.64
## - Channel46    1      4.122 179.06 108.68
## - Channel40    1      4.204 179.15 108.78
## - Channel4     1      4.235 179.18 108.81
## - Channel13    1      4.715 179.66 109.39
## - Channel78    1      5.346 180.29 110.14
## - Channel5     1      5.787 180.73 110.67
## - Channel12    1      6.201 181.14 111.16
## - Channel94    1      6.205 181.15 111.17
## - Channel30    1      6.868 181.81 111.95
## - Channel36    1      6.961 181.91 112.06
## - Channel37    1      7.187 182.13 112.33
## - Channel74    1      9.048 183.99 114.52
## - Channel61    1      9.111 184.05 114.59
## - Channel50    1      9.745 184.69 115.33
## - Channel67    1     10.284 185.23 115.95
## - Channel39    1     11.311 186.25 117.14
## - Channel79    1     11.854 186.80 117.77
## - Channel25    1     12.899 187.84 118.97
## - Channel63    1     13.305 188.25 119.43
```

```
## - Channel42    1    13.434 188.38 119.58
## - Channel84    1    14.193 189.14 120.44
## - Channel87    1    14.466 189.41 120.75
## - Channel22    1    15.241 190.18 121.63
## - Channel28    1    15.948 190.89 122.43
## - Channel59    1    16.648 191.59 123.22
## - Channel99    1    17.280 192.22 123.92
## - Channel2     1    18.515 193.46 125.30
## - Channel34    1    18.536 193.48 125.33
## - Channel92    1    18.589 193.53 125.38
## - Channel24    1    18.653 193.60 125.45
## - Channel64    1    19.298 194.24 126.17
## - Channel56    1    20.961 195.90 128.00
## - Channel29    1    21.310 196.25 128.39
## - Channel60    1    21.876 196.82 129.00
## - Channel51    1    22.324 197.27 129.49
## - Channel68    1    22.761 197.70 129.97
## - Channel1     1    26.966 201.91 134.49
## - Channel81    1    27.785 202.73 135.36
## - Channel85    1    28.000 202.94 135.59
## - Channel69    1    28.419 203.36 136.04
## - Channel80    1    28.610 203.55 136.24
## - Channel45    1    29.070 204.01 136.72
## - Channel55    1    30.000 204.94 137.70
## - Channel73    1    33.366 208.31 141.20
## - Channel71    1    34.556 209.50 142.43
## - Channel52    1    37.655 212.60 145.59
## - Channel54    1    39.974 214.92 147.92
##
## Step:  AIC=104.52
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel10 + Channel11 + Channel12 +
##     Channel13 + Channel14 + Channel15 + Channel16 + Channel17 +
##     Channel18 + Channel19 + Channel20 + Channel21 + Channel22 +
##     Channel24 + Channel25 + Channel26 + Channel27 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel73 + Channel74 + Channel75 + Channel76 +
##     Channel78 + Channel79 + Channel80 + Channel81 + Channel84 +
##     Channel85 + Channel87 + Channel88 + Channel92 + Channel94 +
##     Channel95 + Channel97 + Channel98 + Channel99
##
##             Df Sum of Sq    RSS    AIC
## - Channel10   1     0.677 176.31 103.34
## - Channel18   1     0.709 176.34 103.38
## - Channel27   1     1.012 176.64 103.75
## - Channel95   1     1.063 176.69 103.81
## - Channel16   1     1.289 176.92 104.09
## - Channel17   1     1.364 177.00 104.18
## - Channel97   1     1.365 177.00 104.18
```

```
## - Channel26    1       1.464 177.09 104.30
## - Channel76    1       1.484 177.12 104.33
## - Channel11    1       1.589 177.22 104.45
## <none>                 175.63 104.52
## - Channel21    1       1.833 177.46 104.75
## - Channel48    1       1.851 177.48 104.77
## - Channel88    1       1.882 177.51 104.81
## - Channel31    1       1.921 177.55 104.86
## - Channel98    1       1.941 177.57 104.88
## - Channel19    1       1.953 177.58 104.89
## - Channel65    1       2.009 177.64 104.96
## - Channel20    1       2.194 177.82 105.19
## - Channel7     1       2.263 177.89 105.27
## - Channel75    1       2.520 178.15 105.58
## - Channel8     1       2.527 178.16 105.59
## + Channel62    1       0.687 174.94 105.67
## + Channel6     1       0.608 175.02 105.77
## - Channel15    1       2.830 178.46 105.95
## + Channel35    1       0.403 175.23 106.02
## + Channel53    1       0.338 175.29 106.10
## + Channel38    1       0.290 175.34 106.16
## + Channel57    1       0.253 175.38 106.21
## + Channel23    1       0.246 175.38 106.21
## + Channel90    1       0.222 175.41 106.24
## + Channel83    1       0.218 175.41 106.25
## + Channel44    1       0.212 175.42 106.26
## + Channel91    1       0.168 175.46 106.31
## + Channel77    1       0.159 175.47 106.32
## + Channel72    1       0.142 175.49 106.34
## + Channel96    1       0.139 175.49 106.34
## + Channel70    1       0.117 175.51 106.37
## + Channel66    1       0.102 175.53 106.39
## + Channel58    1       0.097 175.53 106.40
## + Channel33    1       0.084 175.55 106.41
## + Channel89    1       0.084 175.55 106.41
## + Channel9     1       0.081 175.55 106.42
## + Channel86    1       0.046 175.59 106.46
## + Channel100   1       0.044 175.59 106.46
## + Channel3     1       0.036 175.59 106.47
## + Channel93    1       0.035 175.60 106.47
## + Channel82    1       0.031 175.60 106.48
## + Channel49    1       0.022 175.61 106.49
## + Channel43    1       0.008 175.62 106.51
## - Channel46    1       3.628 179.26 106.91
## - Channel14    1       3.738 179.37 107.04
## - Channel32    1       3.749 179.38 107.06
## - Channel47    1       3.919 179.55 107.26
## - Channel4     1       4.028 179.66 107.39
## - Channel41    1       4.528 180.16 107.99
## - Channel40    1       4.670 180.30 108.16
## - Channel13    1       4.740 180.37 108.24
## - Channel78    1       5.477 181.11 109.12
## - Channel5     1       5.798 181.43 109.50
## - Channel12    1       6.182 181.81 109.95
```

```
## - Channel30    1      6.895 182.53 110.80
## - Channel94    1      6.932 182.56 110.84
## - Channel36    1      7.087 182.72 111.02
## - Channel37    1      7.118 182.75 111.06
## - Channel74    1      8.625 184.25 112.82
## - Channel61    1      9.120 184.75 113.40
## - Channel67    1      9.961 185.59 114.38
## - Channel50    1     10.156 185.79 114.60
## - Channel79    1     11.439 187.07 116.08
## - Channel39    1     11.582 187.21 116.25
## - Channel84    1     13.604 189.23 118.56
## - Channel25    1     13.665 189.30 118.62
## - Channel42    1     13.754 189.38 118.73
## - Channel87    1     14.644 190.28 119.73
## - Channel22    1     15.032 190.66 120.17
## - Channel28    1     15.517 191.15 120.72
## - Channel99    1     16.794 192.43 122.15
## - Channel59    1     17.479 193.11 122.91
## - Channel34    1     18.275 193.91 123.80
## - Channel2     1     18.409 194.04 123.95
## - Channel92    1     18.970 194.60 124.57
## - Channel24    1     19.412 195.04 125.06
## - Channel64    1     20.817 196.45 126.60
## - Channel29    1     21.259 196.89 127.08
## - Channel60    1     21.454 197.08 127.29
## - Channel68    1     22.888 198.52 128.85
## - Channel51    1     23.264 198.90 129.26
## - Channel56    1     23.492 199.12 129.51
## - Channel63    1     24.553 200.18 130.65
## - Channel81    1     27.236 202.87 133.51
## - Channel85    1     27.460 203.09 133.75
## - Channel1     1     27.534 203.16 133.83
## - Channel80    1     27.963 203.59 134.28
## - Channel45    1     28.383 204.01 134.72
## - Channel69    1     28.617 204.25 134.97
## - Channel55    1     32.007 207.64 138.51
## - Channel73    1     33.152 208.78 139.69
## - Channel71    1     34.062 209.69 140.63
## - Channel52    1     38.989 214.62 145.62
## - Channel54    1     41.498 217.13 148.12
##
## Step:  AIC=103.34
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel16 + Channel17 + Channel18 +
##     Channel19 + Channel20 + Channel21 + Channel22 + Channel24 +
##     Channel25 + Channel26 + Channel27 + Channel28 + Channel29 +
##     Channel30 + Channel31 + Channel32 + Channel34 + Channel36 +
##     Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##     Channel45 + Channel46 + Channel47 + Channel48 + Channel50 +
##     Channel51 + Channel52 + Channel54 + Channel55 + Channel56 +
##     Channel59 + Channel60 + Channel61 + Channel63 + Channel64 +
##     Channel65 + Channel67 + Channel68 + Channel69 + Channel71 +
##     Channel73 + Channel74 + Channel75 + Channel76 + Channel78 +
```

```
##       Channel79 + Channel80 + Channel81 + Channel84 + Channel85 +
##       Channel87 + Channel88 + Channel92 + Channel94 + Channel95 +
##       Channel97 + Channel98 + Channel99
##
##             Df Sum of Sq    RSS    AIC
## - Channel18   1     0.555 176.86 102.02
## - Channel11   1     0.916 177.22 102.46
## - Channel27   1     0.948 177.26 102.50
## - Channel95   1     1.000 177.31 102.56
## - Channel16   1     1.085 177.39 102.66
## - Channel17   1     1.179 177.49 102.78
## - Channel97   1     1.258 177.57 102.87
## - Channel76   1     1.425 177.73 103.07
## - Channel21   1     1.608 177.92 103.30
## <none>                     176.31 103.34
## - Channel26   1     1.719 178.03 103.43
## - Channel48   1     1.965 178.27 103.72
## - Channel7    1     2.053 178.36 103.83
## - Channel31   1     2.085 178.39 103.87
## - Channel88   1     2.193 178.50 104.00
## - Channel98   1     2.225 178.53 104.04
## - Channel19   1     2.305 178.61 104.14
## - Channel75   1     2.507 178.81 104.38
## - Channel15   1     2.511 178.82 104.38
## - Channel65   1     2.518 178.83 104.39
## - Channel20   1     2.580 178.89 104.47
## + Channel10   1     0.677 175.63 104.52
## + Channel6    1     0.651 175.66 104.55
## + Channel62   1     0.626 175.68 104.58
## + Channel53   1     0.497 175.81 104.74
## + Channel9    1     0.412 175.90 104.84
## - Channel8    1     3.035 179.34 105.01
## + Channel38   1     0.248 176.06 105.04
## + Channel35   1     0.237 176.07 105.05
## + Channel57   1     0.223 176.09 105.07
## + Channel44   1     0.217 176.09 105.08
## + Channel90   1     0.210 176.10 105.09
## + Channel91   1     0.181 176.13 105.12
## + Channel33   1     0.178 176.13 105.13
## + Channel72   1     0.163 176.15 105.14
## + Channel23   1     0.162 176.15 105.14
## + Channel66   1     0.156 176.15 105.15
## + Channel83   1     0.124 176.18 105.19
## + Channel96   1     0.118 176.19 105.20
## + Channel70   1     0.110 176.20 105.21
## + Channel86   1     0.097 176.21 105.22
## + Channel100  1     0.080 176.23 105.25
## + Channel58   1     0.070 176.24 105.26
## + Channel77   1     0.066 176.24 105.26
## + Channel49   1     0.062 176.25 105.27
## + Channel89   1     0.057 176.25 105.27
## + Channel93   1     0.055 176.25 105.28
## - Channel14   1     3.284 179.59 105.31
## + Channel3    1     0.017 176.29 105.32
```

```
## + Channel82   1      0.003 176.31 105.34
## + Channel43   1      0.001 176.31 105.34
## - Channel46   1      3.409 179.72 105.46
## - Channel32   1      4.042 180.35 106.22
## - Channel13   1      4.181 180.49 106.38
## - Channel40   1      4.249 180.56 106.46
## - Channel41   1      4.313 180.62 106.54
## - Channel4    1      4.522 180.83 106.79
## - Channel47   1      4.674 180.98 106.97
## - Channel12   1      5.510 181.82 107.96
## - Channel5    1      5.693 182.00 108.17
## - Channel78   1      5.888 182.20 108.41
## - Channel94   1      6.631 182.94 109.28
## - Channel37   1      6.960 183.27 109.67
## - Channel30   1      7.228 183.54 109.98
## - Channel36   1      7.457 183.76 110.25
## - Channel74   1      8.369 184.68 111.31
## - Channel67   1      9.286 185.59 112.38
## - Channel61   1      9.419 185.73 112.53
## - Channel50   1      9.671 185.98 112.82
## - Channel39   1     10.955 187.26 114.30
## - Channel79   1     11.556 187.86 114.99
## - Channel42   1     13.733 190.04 117.47
## - Channel84   1     13.769 190.08 117.51
## - Channel25   1     14.753 191.06 118.62
## - Channel22   1     14.760 191.07 118.63
## - Channel87   1     15.391 191.70 119.34
## - Channel28   1     16.208 192.52 120.25
## - Channel59   1     17.173 193.48 121.33
## - Channel99   1     17.766 194.07 121.98
## - Channel92   1     18.435 194.74 122.72
## - Channel2    1     19.338 195.65 123.72
## - Channel34   1     19.787 196.09 124.21
## - Channel24   1     20.335 196.64 124.81
## - Channel60   1     21.313 197.62 125.88
## - Channel64   1     22.064 198.37 126.69
## - Channel29   1     22.205 198.51 126.85
## - Channel68   1     22.626 198.93 127.30
## - Channel51   1     22.655 198.96 127.33
## - Channel56   1     23.082 199.39 127.79
## - Channel63   1     25.588 201.90 130.48
## - Channel81   1     27.024 203.33 132.00
## - Channel1    1     27.173 203.48 132.16
## - Channel80   1     27.975 204.28 133.01
## - Channel85   1     28.079 204.39 133.12
## - Channel45   1     28.278 204.59 133.32
## - Channel69   1     28.326 204.63 133.38
## - Channel55   1     31.591 207.90 136.78
## - Channel73   1     32.763 209.07 137.99
## - Channel71   1     33.402 209.71 138.64
## - Channel52   1     38.403 214.71 143.71
## - Channel54   1     41.074 217.38 146.37
##
## Step:  AIC=102.02
```

```
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel16 + Channel17 + Channel19 +
##     Channel20 + Channel21 + Channel22 + Channel24 + Channel25 +
##     Channel26 + Channel27 + Channel28 + Channel29 + Channel30 +
##     Channel31 + Channel32 + Channel34 + Channel36 + Channel37 +
##     Channel39 + Channel40 + Channel41 + Channel42 + Channel45 +
##     Channel46 + Channel47 + Channel48 + Channel50 + Channel51 +
##     Channel52 + Channel54 + Channel55 + Channel56 + Channel59 +
##     Channel60 + Channel61 + Channel63 + Channel64 + Channel65 +
##     Channel67 + Channel68 + Channel69 + Channel71 + Channel73 +
##     Channel74 + Channel75 + Channel76 + Channel78 + Channel79 +
##     Channel80 + Channel81 + Channel84 + Channel85 + Channel87 +
##     Channel88 + Channel92 + Channel94 + Channel95 + Channel97 +
##     Channel98 + Channel99
##
##              Df Sum of Sq    RSS    AIC
## - Channel27   1     0.801 177.66 100.99
## - Channel11   1     0.845 177.71 101.04
## - Channel16   1     0.888 177.75 101.10
## - Channel95   1     1.079 177.94 101.33
## - Channel97   1     1.250 178.11 101.53
## - Channel76   1     1.286 178.15 101.58
## - Channel21   1     1.577 178.44 101.93
## <none>                     176.86 102.02
## - Channel7    1     1.895 178.76 102.31
## - Channel26   1     1.932 178.80 102.36
## - Channel31   1     1.975 178.84 102.41
## - Channel88   1     2.055 178.92 102.50
## - Channel98   1     2.242 179.10 102.73
## - Channel48   1     2.309 179.17 102.81
## - Channel75   1     2.404 179.27 102.92
## - Channel65   1     2.406 179.27 102.92
## + Channel62   1     0.564 176.30 103.33
## + Channel18   1     0.555 176.31 103.34
## + Channel10   1     0.523 176.34 103.38
## - Channel17   1     2.845 179.71 103.45
## + Channel53   1     0.460 176.40 103.46
## - Channel20   1     2.868 179.73 103.48
## + Channel6    1     0.438 176.43 103.48
## - Channel8    1     2.926 179.79 103.55
## + Channel90   1     0.384 176.48 103.55
## + Channel91   1     0.332 176.53 103.61
## + Channel66   1     0.316 176.55 103.63
## + Channel57   1     0.277 176.59 103.68
## + Channel9    1     0.229 176.63 103.74
## + Channel38   1     0.228 176.63 103.74
## + Channel44   1     0.203 176.66 103.77
## + Channel33   1     0.200 176.66 103.78
## + Channel23   1     0.188 176.68 103.79
## - Channel15   1     3.158 180.02 103.82
## + Channel35   1     0.153 176.71 103.83
## + Channel89   1     0.139 176.72 103.85
## + Channel83   1     0.109 176.75 103.89
```

```
## + Channel72    1     0.099 176.76 103.90
## + Channel100   1     0.083 176.78 103.92
## + Channel96    1     0.066 176.80 103.94
## + Channel77    1     0.062 176.80 103.94
## + Channel70    1     0.047 176.82 103.96
## + Channel58    1     0.038 176.82 103.97
## + Channel86    1     0.037 176.83 103.97
## + Channel49    1     0.034 176.83 103.98
## + Channel3     1     0.026 176.84 103.99
## + Channel93    1     0.007 176.86 104.01
## + Channel82    1     0.003 176.86 104.02
## + Channel43    1     0.000 176.86 104.02
## - Channel14    1     3.477 180.34 104.20
## - Channel46    1     3.519 180.38 104.25
## - Channel40    1     3.916 180.78 104.73
## - Channel32    1     3.954 180.82 104.77
## - Channel41    1     4.008 180.87 104.84
## - Channel13    1     4.080 180.94 104.92
## - Channel4     1     4.209 181.07 105.08
## - Channel19    1     4.522 181.38 105.45
## - Channel47    1     4.821 181.69 105.80
## - Channel12    1     5.314 182.18 106.38
## - Channel5     1     5.457 182.32 106.55
## - Channel78    1     6.294 183.16 107.54
## - Channel94    1     6.423 183.29 107.69
## - Channel37    1     6.948 183.81 108.30
## - Channel30    1     7.030 183.89 108.40
## - Channel36    1     7.800 184.66 109.30
## - Channel74    1     8.421 185.28 110.02
## - Channel61    1     9.044 185.91 110.74
## - Channel67    1     9.297 186.16 111.03
## - Channel50    1    10.486 187.35 112.40
## - Channel39    1    10.503 187.37 112.42
## - Channel79    1    13.244 190.11 115.55
## - Channel42    1    13.350 190.21 115.66
## - Channel84    1    13.607 190.47 115.95
## - Channel25    1    14.491 191.35 116.95
## - Channel22    1    14.777 191.64 117.27
## - Channel87    1    15.012 191.88 117.53
## - Channel28    1    15.839 192.70 118.46
## - Channel59    1    16.781 193.64 119.51
## - Channel99    1    17.440 194.30 120.24
## - Channel92    1    17.984 194.85 120.84
## - Channel2     1    19.189 196.05 122.17
## - Channel24    1    19.923 196.79 122.97
## - Channel34    1    20.282 197.15 123.36
## - Channel60    1    20.768 197.63 123.89
## - Channel29    1    21.855 198.72 125.07
## - Channel64    1    21.975 198.84 125.20
## - Channel68    1    22.379 199.24 125.64
## - Channel56    1    23.243 200.11 126.56
## - Channel51    1    23.749 200.61 127.11
## - Channel63    1    25.525 202.39 129.00
## - Channel81    1    26.968 203.83 130.53
```

```
## - Channel1     1     27.230 204.09 130.81
## - Channel85    1     27.568 204.43 131.16
## - Channel69    1     27.921 204.78 131.53
## - Channel45    1     28.594 205.46 132.24
## - Channel80    1     29.147 206.01 132.82
## - Channel55    1     31.586 208.45 135.35
## - Channel73    1     32.402 209.26 136.19
## - Channel71    1     32.849 209.71 136.65
## - Channel52    1     39.162 216.03 143.02
## - Channel54    1     41.011 217.88 144.85
##
## Step:  AIC=100.99
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##      Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##      Channel14 + Channel15 + Channel16 + Channel17 + Channel19 +
##      Channel20 + Channel21 + Channel22 + Channel24 + Channel25 +
##      Channel26 + Channel28 + Channel29 + Channel30 + Channel31 +
##      Channel32 + Channel34 + Channel36 + Channel37 + Channel39 +
##      Channel40 + Channel41 + Channel42 + Channel45 + Channel46 +
##      Channel47 + Channel48 + Channel50 + Channel51 + Channel52 +
##      Channel54 + Channel55 + Channel56 + Channel59 + Channel60 +
##      Channel61 + Channel63 + Channel64 + Channel65 + Channel67 +
##      Channel68 + Channel69 + Channel71 + Channel73 + Channel74 +
##      Channel75 + Channel76 + Channel78 + Channel79 + Channel80 +
##      Channel81 + Channel84 + Channel85 + Channel87 + Channel88 +
##      Channel92 + Channel94 + Channel95 + Channel97 + Channel98 +
##      Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel16   1     0.812 178.48  99.971
## - Channel95   1     1.108 178.77 100.327
## - Channel11   1     1.244 178.91 100.491
## - Channel21   1     1.365 179.03 100.635
## - Channel76   1     1.392 179.06 100.668
## - Channel31   1     1.498 179.16 100.796
## - Channel97   1     1.515 179.18 100.816
## <none>                     177.66 100.990
## - Channel7    1     1.870 179.53 101.242
## - Channel98   1     1.969 179.63 101.360
## - Channel88   1     2.114 179.78 101.534
## - Channel75   1     2.385 180.05 101.857
## - Channel48   1     2.497 180.16 101.991
## + Channel27   1     0.801 176.86 102.019
## - Channel65   1     2.616 180.28 102.133
## - Channel20   1     2.703 180.37 102.236
## + Channel10   1     0.490 177.17 102.396
## + Channel91   1     0.471 177.19 102.420
## + Channel90   1     0.466 177.20 102.426
## - Channel8    1     2.883 180.55 102.451
## + Channel62   1     0.408 177.26 102.496
## + Channel18   1     0.408 177.26 102.496
## + Channel6    1     0.393 177.27 102.515
## + Channel66   1     0.389 177.28 102.520
## + Channel53   1     0.387 177.28 102.522
```

```
## + Channel57    1      0.307 177.36 102.619
## - Channel17    1      3.044 180.71 102.643
## + Channel38    1      0.286 177.38 102.644
## + Channel33    1      0.229 177.44 102.713
## + Channel9     1      0.183 177.48 102.769
## + Channel89    1      0.173 177.49 102.781
## + Channel35    1      0.173 177.49 102.781
## + Channel23    1      0.168 177.50 102.786
## + Channel72    1      0.146 177.52 102.814
## + Channel44    1      0.145 177.52 102.815
## + Channel83    1      0.126 177.54 102.838
## + Channel100   1      0.123 177.54 102.841
## + Channel77    1      0.099 177.56 102.870
## - Channel15    1      3.256 180.92 102.895
## + Channel96    1      0.064 177.60 102.913
## + Channel58    1      0.047 177.62 102.934
## + Channel49    1      0.043 177.62 102.938
## - Channel32    1      3.296 180.96 102.942
## - Channel46    1      3.302 180.97 102.950
## + Channel70    1      0.021 177.64 102.965
## + Channel3     1      0.014 177.65 102.974
## + Channel86    1      0.009 177.66 102.979
## + Channel93    1      0.007 177.66 102.982
## + Channel82    1      0.003 177.66 102.987
## + Channel43    1      0.001 177.66 102.989
## - Channel14    1      3.466 181.13 103.145
## - Channel40    1      3.651 181.31 103.363
## - Channel41    1      3.686 181.35 103.405
## - Channel4     1      3.769 181.43 103.504
## - Channel19    1      3.969 181.63 103.741
## - Channel13    1      4.071 181.74 103.862
## - Channel26    1      4.826 182.49 104.753
## - Channel5     1      4.994 182.66 104.950
## - Channel47    1      5.165 182.83 105.151
## - Channel12    1      5.741 183.41 105.828
## - Channel78    1      5.827 183.49 105.928
## - Channel94    1      6.290 183.95 106.470
## - Channel30    1      6.560 184.22 106.786
## - Channel37    1      7.005 184.67 107.305
## - Channel36    1      7.251 184.91 107.591
## - Channel74    1      8.220 185.88 108.714
## - Channel61    1      9.503 187.17 110.193
## - Channel67    1      9.609 187.27 110.315
## - Channel50    1     10.444 188.11 111.272
## - Channel39    1     10.520 188.19 111.359
## - Channel79    1     12.642 190.31 113.770
## - Channel42    1     12.929 190.59 114.094
## - Channel22    1     14.006 191.67 115.305
## - Channel25    1     14.048 191.71 115.352
## - Channel84    1     14.195 191.86 115.516
## - Channel87    1     15.090 192.75 116.517
## - Channel59    1     16.252 193.92 117.809
## - Channel99    1     16.963 194.63 118.596
## - Channel92    1     17.675 195.34 119.381
```

```
## - Channel28    1    17.783 195.45 119.500
## - Channel2     1    18.554 196.22 120.347
## - Channel24    1    19.125 196.79 120.972
## - Channel34    1    19.579 197.24 121.467
## - Channel60    1    20.659 198.32 122.641
## - Channel29    1    21.270 198.93 123.302
## - Channel68    1    22.411 200.08 124.532
## - Channel64    1    23.206 200.87 125.384
## - Channel51    1    23.407 201.07 125.600
## - Channel56    1    23.848 201.51 126.070
## - Channel63    1    26.354 204.02 128.727
## - Channel1     1    26.649 204.31 129.039
## - Channel81    1    26.716 204.38 129.109
## - Channel69    1    27.712 205.38 130.155
## - Channel85    1    28.048 205.71 130.506
## - Channel45    1    28.104 205.77 130.564
## - Channel80    1    28.476 206.14 130.953
## - Channel73    1    31.749 209.41 134.339
## - Channel71    1    32.273 209.94 134.877
## - Channel55    1    32.666 210.33 135.279
## - Channel52    1    38.749 216.41 141.409
## - Channel54    1    41.952 219.62 144.568
##
## Step:  AIC=99.97
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel21 + Channel22 + Channel24 + Channel25 + Channel26 +
##     Channel28 + Channel29 + Channel30 + Channel31 + Channel32 +
##     Channel34 + Channel36 + Channel37 + Channel39 + Channel40 +
##     Channel41 + Channel42 + Channel45 + Channel46 + Channel47 +
##     Channel48 + Channel50 + Channel51 + Channel52 + Channel54 +
##     Channel55 + Channel56 + Channel59 + Channel60 + Channel61 +
##     Channel63 + Channel64 + Channel65 + Channel67 + Channel68 +
##     Channel69 + Channel71 + Channel73 + Channel74 + Channel75 +
##     Channel76 + Channel78 + Channel79 + Channel80 + Channel81 +
##     Channel84 + Channel85 + Channel87 + Channel88 + Channel92 +
##     Channel94 + Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel21   1     0.973 179.45  99.140
## - Channel95   1     0.994 179.47  99.165
## - Channel31   1     1.316 179.79  99.551
## - Channel76   1     1.379 179.86  99.627
## - Channel97   1     1.551 180.03  99.832
## <none>                    178.48  99.971
## - Channel98   1     1.759 180.24 100.080
## - Channel7    1     1.838 180.31 100.174
## - Channel11   1     2.226 180.70 100.636
## - Channel17   1     2.246 180.72 100.660
## - Channel75   1     2.309 180.79 100.735
## - Channel48   1     2.354 180.83 100.789
## - Channel88   1     2.398 180.88 100.841
## + Channel16   1     0.812 177.66 100.990
```

```
## - Channel65    1      2.587 181.06 101.065
## + Channel27    1      0.725 177.75 101.096
## + Channel90    1      0.695 177.78 101.132
## + Channel91    1      0.617 177.86 101.227
## + Channel62    1      0.580 177.90 101.271
## - Channel32    1      2.886 181.36 101.420
## + Channel66    1      0.391 178.09 101.500
## + Channel10    1      0.362 178.12 101.535
## + Channel57    1      0.336 178.14 101.566
## + Channel6     1      0.329 178.15 101.574
## + Channel89    1      0.322 178.16 101.584
## + Channel53    1      0.268 178.21 101.648
## + Channel100   1      0.267 178.21 101.649
## + Channel35    1      0.266 178.21 101.651
## + Channel18    1      0.256 178.22 101.663
## + Channel33    1      0.248 178.23 101.672
## - Channel8     1      3.106 181.58 101.681
## + Channel38    1      0.183 178.29 101.751
## + Channel44    1      0.158 178.32 101.781
## + Channel23    1      0.137 178.34 101.806
## + Channel93    1      0.126 178.35 101.820
## + Channel9     1      0.110 178.37 101.839
## + Channel83    1      0.105 178.37 101.845
## + Channel77    1      0.103 178.37 101.847
## - Channel40    1      3.253 181.73 101.854
## + Channel72    1      0.063 178.41 101.895
## - Channel46    1      3.294 181.77 101.903
## + Channel58    1      0.057 178.42 101.903
## + Channel49    1      0.017 178.46 101.951
## + Channel3     1      0.016 178.46 101.953
## + Channel96    1      0.008 178.47 101.961
## + Channel82    1      0.004 178.47 101.966
## + Channel70    1      0.002 178.47 101.969
## + Channel86    1      0.001 178.48 101.970
## + Channel43    1      0.000 178.48 101.971
## - Channel41    1      3.487 181.96 102.132
## - Channel20    1      3.860 182.34 102.572
## - Channel4     1      3.924 182.40 102.648
## - Channel26    1      4.797 183.27 103.673
## - Channel47    1      4.998 183.47 103.909
## - Channel19    1      5.039 183.52 103.958
## - Channel5     1      5.137 183.61 104.073
## - Channel94    1      5.796 184.27 104.843
## - Channel13    1      5.910 184.39 104.976
## - Channel78    1      6.088 184.56 105.183
## - Channel14    1      6.147 184.62 105.252
## - Channel37    1      6.524 185.00 105.690
## - Channel30    1      6.604 185.08 105.783
## - Channel36    1      6.828 185.31 106.044
## - Channel12    1      7.974 186.45 107.369
## - Channel74    1      8.297 186.77 107.741
## - Channel61    1      9.352 187.83 108.951
## - Channel67    1      9.554 188.03 109.183
## - Channel39    1      9.781 188.26 109.442
```

```
## - Channel50   1     10.159 188.64 109.874
## - Channel79   1     12.711 191.19 112.763
## - Channel42   1     12.806 191.28 112.870
## - Channel15   1     13.287 191.76 113.410
## - Channel22   1     13.376 191.85 113.510
## - Channel25   1     14.364 192.84 114.614
## - Channel84   1     14.648 193.12 114.930
## - Channel87   1     15.545 194.02 115.926
## - Channel99   1     16.296 194.77 116.756
## - Channel59   1     16.366 194.84 116.835
## - Channel92   1     16.863 195.34 117.382
## - Channel28   1     17.773 196.25 118.381
## - Channel2    1     18.560 197.04 119.242
## - Channel34   1     18.772 197.25 119.473
## - Channel24   1     19.417 197.89 120.175
## - Channel60   1     20.664 199.14 121.525
## - Channel29   1     21.745 200.22 122.690
## - Channel68   1     22.052 200.53 123.019
## - Channel51   1     22.832 201.31 123.853
## - Channel64   1     22.974 201.45 124.005
## - Channel56   1     23.195 201.67 124.240
## - Channel63   1     25.912 204.39 127.118
## - Channel1    1     26.422 204.90 127.654
## - Channel81   1     26.851 205.33 128.103
## - Channel69   1     27.365 205.84 128.641
## - Channel45   1     27.950 206.43 129.251
## - Channel80   1     28.082 206.56 129.388
## - Channel85   1     28.453 206.93 129.774
## - Channel55   1     31.859 210.34 133.284
## - Channel73   1     32.014 210.49 133.443
## - Channel71   1     32.342 210.82 133.778
## - Channel52   1     37.940 216.42 139.412
## - Channel54   1     41.186 219.66 142.612
##
## Step:  AIC=99.14
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel73 + Channel74 + Channel75 + Channel76 +
##     Channel78 + Channel79 + Channel80 + Channel81 + Channel84 +
##     Channel85 + Channel87 + Channel88 + Channel92 + Channel94 +
##     Channel95 + Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel95   1      0.881 180.33  98.193
## - Channel76   1      1.175 180.62  98.543
## - Channel97   1      1.519 180.97  98.952
```

```
## - Channel31    1        1.601 181.05  99.050
## <none>                         179.45  99.140
## - Channel98    1        1.691 181.14  99.156
## - Channel7     1        1.860 181.31  99.357
## - Channel75    1        2.043 181.49  99.574
## - Channel17    1        2.157 181.61  99.709
## - Channel48    1        2.214 181.66  99.776
## - Channel88    1        2.279 181.73  99.854
## + Channel21    1        0.973 178.48  99.971
## - Channel65    1        2.783 182.23 100.449
## + Channel27    1        0.566 178.88 100.461
## + Channel35    1        0.525 178.92 100.510
## + Channel66    1        0.509 178.94 100.529
## + Channel90    1        0.508 178.94 100.530
## + Channel62    1        0.477 178.97 100.567
## + Channel16    1        0.421 179.03 100.635
## + Channel6     1        0.407 179.04 100.652
## + Channel57    1        0.406 179.04 100.653
## + Channel91    1        0.403 179.05 100.657
## + Channel33    1        0.385 179.06 100.679
## + Channel18    1        0.285 179.16 100.798
## + Channel10    1        0.264 179.19 100.823
## + Channel38    1        0.245 179.21 100.847
## + Channel44    1        0.229 179.22 100.865
## + Channel89    1        0.223 179.23 100.872
## + Channel100   1        0.208 179.24 100.891
## - Channel46    1        3.175 182.62 100.910
## + Channel23    1        0.173 179.28 100.933
## - Channel40    1        3.205 182.65 100.946
## - Channel8     1        3.234 182.68 100.980
## + Channel53    1        0.110 179.34 101.008
## + Channel58    1        0.090 179.36 101.031
## - Channel32    1        3.285 182.73 101.040
## + Channel72    1        0.079 179.37 101.045
## + Channel77    1        0.078 179.37 101.046
## + Channel93    1        0.042 179.41 101.090
## + Channel9     1        0.041 179.41 101.091
## + Channel96    1        0.028 179.42 101.107
## + Channel83    1        0.024 179.43 101.111
## + Channel82    1        0.013 179.44 101.125
## + Channel3     1        0.013 179.44 101.125
## + Channel86    1        0.011 179.44 101.126
## + Channel49    1        0.010 179.44 101.127
## + Channel70    1        0.004 179.45 101.135
## + Channel43    1        0.001 179.45 101.139
## - Channel11    1        3.450 182.90 101.234
## - Channel41    1        3.555 183.00 101.357
## - Channel4     1        4.403 183.85 102.352
## - Channel47    1        4.985 184.44 103.031
## - Channel26    1        5.115 184.56 103.182
## - Channel94    1        5.552 185.00 103.691
## - Channel5     1        5.573 185.02 103.715
## - Channel37    1        6.545 186.00 104.842
## - Channel36    1        6.797 186.25 105.133
```

```
## - Channel78    1       6.807 186.26 105.145
## - Channel30    1       7.099 186.55 105.481
## - Channel14    1       7.569 187.02 106.022
## - Channel74    1       7.715 187.16 106.190
## - Channel13    1       7.896 187.35 106.398
## - Channel19    1       9.141 188.59 107.821
## - Channel39    1       9.607 189.06 108.352
## - Channel67    1       9.703 189.15 108.462
## - Channel50    1       9.873 189.32 108.655
## - Channel61    1      10.340 189.79 109.185
## - Channel12    1      10.823 190.27 109.731
## - Channel79    1      13.035 192.48 112.216
## - Channel42    1      13.037 192.49 112.218
## - Channel25    1      14.106 193.56 113.409
## - Channel84    1      14.165 193.62 113.475
## - Channel15    1      14.468 193.92 113.811
## - Channel87    1      15.000 194.45 114.399
## - Channel99    1      15.980 195.43 115.480
## - Channel92    1      16.808 196.26 116.390
## - Channel59    1      16.946 196.40 116.541
## - Channel2     1      18.085 197.53 117.785
## - Channel28    1      18.235 197.68 117.947
## - Channel24    1      18.504 197.95 118.240
## - Channel34    1      18.995 198.44 118.773
## - Channel60    1      21.695 201.15 121.678
## - Channel68    1      22.015 201.46 122.019
## - Channel29    1      22.300 201.75 122.324
## - Channel51    1      22.345 201.79 122.372
## - Channel64    1      23.265 202.71 123.349
## - Channel56    1      23.577 203.03 123.680
## - Channel20    1      25.177 204.63 125.368
## - Channel1     1      25.598 205.05 125.810
## - Channel63    1      26.378 205.83 126.626
## - Channel81    1      26.597 206.05 126.854
## - Channel69    1      26.922 206.37 127.193
## - Channel85    1      27.557 207.01 127.854
## - Channel80    1      27.682 207.13 127.984
## - Channel45    1      27.718 207.17 128.021
## - Channel73    1      31.189 210.64 131.594
## - Channel55    1      31.924 211.37 132.342
## - Channel71    1      32.494 211.94 132.922
## - Channel22    1      33.041 212.49 133.476
## - Channel52    1      37.335 216.78 137.777
## - Channel54    1      40.926 220.38 141.309
##
## Step:  AIC=98.19
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
```

```
##      Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##      Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##      Channel71 + Channel73 + Channel74 + Channel75 + Channel76 +
##      Channel78 + Channel79 + Channel80 + Channel81 + Channel84 +
##      Channel85 + Channel87 + Channel88 + Channel92 + Channel94 +
##      Channel97 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel97   1     0.663 180.99  96.982
## - Channel76   1     1.446 181.78  97.910
## - Channel7    1     1.611 181.94  98.105
## - Channel31   1     1.648 181.98  98.149
## <none>                     180.33  98.193
## - Channel48   1     1.824 182.15  98.356
## - Channel88   1     2.196 182.53  98.795
## + Channel95   1     0.881 179.45  99.140
## - Channel65   1     2.489 182.82  99.140
## - Channel17   1     2.492 182.82  99.143
## + Channel21   1     0.860 179.47  99.165
## + Channel35   1     0.787 179.54  99.252
## - Channel75   1     2.684 183.01  99.369
## + Channel27   1     0.600 179.73  99.477
## + Channel62   1     0.578 179.75  99.503
## - Channel8    1     2.802 183.13  99.508
## + Channel66   1     0.565 179.77  99.518
## + Channel57   1     0.471 179.86  99.630
## + Channel6    1     0.388 179.94  99.730
## - Channel46   1     2.996 183.33  99.736
## - Channel40   1     3.006 183.34  99.748
## + Channel96   1     0.371 179.96  99.750
## + Channel16   1     0.363 179.97  99.760
## + Channel18   1     0.342 179.99  99.785
## + Channel44   1     0.301 180.03  99.834
## + Channel10   1     0.233 180.10  99.915
## - Channel11   1     3.190 183.52  99.963
## + Channel100  1     0.179 180.15  99.980
## + Channel38   1     0.132 180.20 100.035
## + Channel33   1     0.118 180.21 100.052
## - Channel98   1     3.273 183.60 100.060
## + Channel23   1     0.098 180.23 100.076
## + Channel90   1     0.095 180.24 100.080
## + Channel53   1     0.079 180.25 100.099
## + Channel77   1     0.073 180.26 100.105
## + Channel72   1     0.072 180.26 100.107
## + Channel89   1     0.070 180.26 100.109
## + Channel82   1     0.051 180.28 100.132
## + Channel93   1     0.048 180.28 100.136
## + Channel58   1     0.041 180.29 100.144
## - Channel41   1     3.363 183.69 100.166
## + Channel3    1     0.019 180.31 100.170
## + Channel91   1     0.018 180.31 100.172
## - Channel32   1     3.375 183.71 100.179
## + Channel49   1     0.011 180.32 100.180
## + Channel83   1     0.009 180.32 100.182
```

```
## + Channel43   1      0.006 180.32 100.185
## + Channel86   1      0.001 180.33 100.191
## + Channel70   1      0.001 180.33 100.192
## + Channel9    1      0.001 180.33 100.192
## - Channel47   1      4.794 185.12 101.833
## - Channel26   1      5.116 185.45 102.207
## - Channel4    1      5.145 185.47 102.241
## - Channel37   1      5.901 186.23 103.116
## - Channel36   1      6.069 186.40 103.309
## - Channel5    1      6.876 187.21 104.239
## - Channel30   1      6.973 187.30 104.349
## - Channel14   1      7.277 187.61 104.698
## - Channel13   1      7.660 187.99 105.136
## - Channel78   1      7.899 188.23 105.410
## - Channel74   1      8.444 188.78 106.032
## - Channel19   1      8.894 189.22 106.544
## - Channel39   1      9.321 189.65 107.029
## - Channel50   1      9.575 189.91 107.315
## - Channel94   1      9.669 190.00 107.422
## - Channel12   1     10.741 191.07 108.632
## - Channel61   1     11.069 191.40 109.000
## - Channel67   1     11.580 191.91 109.574
## - Channel42   1     12.796 193.13 110.932
## - Channel84   1     13.419 193.75 111.624
## - Channel79   1     13.539 193.87 111.758
## - Channel25   1     14.043 194.37 112.316
## - Channel87   1     14.407 194.74 112.718
## - Channel15   1     14.498 194.83 112.818
## - Channel92   1     16.009 196.34 114.479
## - Channel2    1     17.328 197.66 115.919
## - Channel59   1     18.359 198.69 117.038
## - Channel24   1     18.401 198.73 117.082
## - Channel34   1     18.430 198.76 117.114
## - Channel28   1     18.635 198.97 117.336
## - Channel99   1     18.992 199.32 117.721
## - Channel29   1     22.220 202.55 121.176
## - Channel64   1     22.497 202.83 121.469
## - Channel51   1     22.898 203.23 121.894
## - Channel60   1     24.410 204.74 123.487
## - Channel1    1     24.765 205.09 123.860
## - Channel20   1     24.850 205.18 123.949
## - Channel63   1     25.553 205.88 124.685
## - Channel81   1     25.751 206.08 124.892
## - Channel68   1     26.390 206.72 125.557
## - Channel56   1     26.475 206.81 125.645
## - Channel85   1     27.040 207.37 126.232
## - Channel80   1     27.093 207.42 126.286
## - Channel45   1     27.224 207.55 126.422
## - Channel69   1     31.358 211.69 130.663
## - Channel73   1     31.766 212.10 131.076
## - Channel22   1     32.608 212.94 131.929
## - Channel71   1     34.000 214.33 133.330
## - Channel55   1     36.927 217.26 136.246
## - Channel52   1     41.075 221.41 140.312
```

```
## - Channel54    1    48.369 228.70 147.281
##
## Step:  AIC=96.98
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##      Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##      Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##      Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##      Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##      Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##      Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##      Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##      Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##      Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##      Channel71 + Channel73 + Channel74 + Channel75 + Channel76 +
##      Channel78 + Channel79 + Channel80 + Channel81 + Channel84 +
##      Channel85 + Channel87 + Channel88 + Channel92 + Channel94 +
##      Channel98 + Channel99
##
##                Df Sum of Sq    RSS     AIC
## - Channel76    1     1.451 182.44  96.699
## <none>                      180.99  96.982
## - Channel48    1     1.746 182.74  97.047
## - Channel7     1     1.780 182.77  97.086
## - Channel31    1     1.942 182.94  97.276
## - Channel75    1     2.194 183.19  97.572
## - Channel17    1     2.347 183.34  97.752
## - Channel65    1     2.412 183.41  97.828
## + Channel35    1     0.942 180.05  97.860
## + Channel21    1     0.915 180.08  97.892
## + Channel66    1     0.804 180.19  98.024
## - Channel88    1     2.597 183.59  98.044
## + Channel27    1     0.769 180.22  98.067
## + Channel97    1     0.663 180.33  98.193
## + Channel62    1     0.628 180.37  98.235
## + Channel57    1     0.547 180.45  98.331
## + Channel16    1     0.431 180.56  98.469
## + Channel6     1     0.331 180.66  98.588
## - Channel8     1     3.094 184.09  98.626
## + Channel18    1     0.272 180.72  98.659
## + Channel44    1     0.248 180.75  98.688
## + Channel23    1     0.199 180.79  98.746
## + Channel10    1     0.192 180.80  98.753
## + Channel90    1     0.179 180.81  98.769
## + Channel33    1     0.155 180.84  98.797
## + Channel38    1     0.133 180.86  98.824
## + Channel96    1     0.127 180.87  98.831
## + Channel89    1     0.109 180.88  98.853
## + Channel100   1     0.092 180.90  98.872
## + Channel91    1     0.091 180.90  98.874
## - Channel11    1     3.314 184.31  98.883
## - Channel40    1     3.321 184.31  98.891
## + Channel49    1     0.071 180.92  98.898
## + Channel93    1     0.055 180.94  98.917
## + Channel83    1     0.053 180.94  98.919
```

```
## + Channel82   1     0.046 180.95  98.927
## + Channel53   1     0.045 180.95  98.928
## + Channel77   1     0.027 180.97  98.950
## + Channel95   1     0.025 180.97  98.952
## + Channel3    1     0.015 180.98  98.964
## + Channel9    1     0.010 180.98  98.970
## + Channel58   1     0.008 180.99  98.972
## + Channel86   1     0.005 180.99  98.976
## + Channel72   1     0.005 180.99  98.976
## + Channel43   1     0.003 180.99  98.979
## + Channel70   1     0.001 180.99  98.981
## - Channel46   1     3.456 184.45  99.049
## - Channel41   1     3.626 184.62  99.247
## - Channel32   1     3.846 184.84  99.503
## - Channel47   1     4.672 185.67 100.462
## - Channel26   1     5.108 186.10 100.966
## - Channel4    1     5.278 186.27 101.162
## - Channel36   1     6.442 187.44 102.501
## - Channel37   1     6.465 187.46 102.528
## - Channel5    1     7.045 188.04 103.192
## - Channel14   1     7.254 188.25 103.431
## - Channel78   1     7.259 188.25 103.437
## - Channel30   1     7.512 188.51 103.725
## - Channel13   1     7.566 188.56 103.787
## - Channel74   1     7.801 188.79 104.054
## - Channel19   1     8.817 189.81 105.209
## - Channel50   1     9.131 190.12 105.564
## - Channel39   1    10.168 191.16 106.733
## - Channel12   1    10.838 191.83 107.485
## - Channel94   1    11.003 192.00 107.671
## - Channel61   1    12.178 193.17 108.982
## - Channel67   1    12.216 193.21 109.025
## - Channel79   1    12.897 193.89 109.781
## - Channel84   1    12.972 193.97 109.864
## - Channel42   1    13.526 194.52 110.477
## - Channel25   1    13.711 194.70 110.682
## - Channel15   1    14.748 195.74 111.824
## - Channel87   1    14.914 195.91 112.006
## - Channel92   1    15.347 196.34 112.481
## - Channel98   1    16.443 197.44 113.677
## - Channel2    1    17.752 198.75 115.098
## - Channel24   1    18.144 199.14 115.522
## - Channel28   1    18.839 199.83 116.271
## - Channel59   1    19.105 200.10 116.557
## - Channel34   1    19.667 200.66 117.160
## - Channel51   1    22.467 203.46 120.139
## - Channel64   1    22.578 203.57 120.256
## - Channel29   1    22.708 203.70 120.394
## - Channel20   1    24.587 205.58 122.368
## - Channel81   1    25.088 206.08 122.892
## - Channel1    1    25.349 206.34 123.163
## - Channel63   1    26.046 207.04 123.888
## - Channel60   1    26.422 207.42 124.279
## - Channel80   1    26.430 207.42 124.287
```

```
## - Channel68    1     26.542 207.54 124.403
## - Channel85    1     26.685 207.68 124.551
## - Channel99    1     26.899 207.89 124.773
## - Channel56    1     27.853 208.85 125.757
## - Channel45    1     29.897 210.89 127.851
## - Channel69    1     30.715 211.71 128.683
## - Channel73    1     31.259 212.25 129.235
## - Channel22    1     32.838 213.83 130.828
## - Channel71    1     33.338 214.33 131.331
## - Channel55    1     39.559 220.55 137.482
## - Channel52    1     41.624 222.62 139.486
## - Channel54    1     52.343 233.34 149.596
##
## Step:  AIC=96.7
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel73 + Channel74 + Channel75 + Channel78 +
##     Channel79 + Channel80 + Channel81 + Channel84 + Channel85 +
##     Channel87 + Channel88 + Channel92 + Channel94 + Channel98 +
##     Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel75   1     0.751 183.19  95.582
## - Channel17   1     1.525 183.97  96.489
## - Channel31   1     1.538 183.98  96.504
## - Channel7    1     1.658 184.10  96.643
## <none>                    182.44  96.699
## + Channel76   1     1.451 180.99  96.982
## + Channel35   1     1.274 181.17  97.192
## + Channel27   1     0.902 181.54  97.633
## + Channel21   1     0.681 181.76  97.894
## + Channel97   1     0.668 181.78  97.910
## - Channel48   1     2.792 185.24  97.964
## - Channel8    1     2.851 185.29  98.032
## + Channel57   1     0.563 181.88  98.034
## - Channel65   1     2.880 185.32  98.066
## + Channel89   1     0.533 181.91  98.070
## + Channel90   1     0.502 181.94  98.107
## + Channel16   1     0.449 182.00  98.169
## + Channel66   1     0.426 182.02  98.197
## + Channel77   1     0.391 182.05  98.238
## + Channel6    1     0.370 182.07  98.262
## - Channel88   1     3.061 185.50  98.276
## + Channel72   1     0.343 182.10  98.295
## + Channel62   1     0.299 182.15  98.346
## - Channel11   1     3.125 185.57  98.351
```

```
## + Channel44    1      0.269 182.18  98.382
## + Channel82    1      0.262 182.18  98.390
## + Channel91    1      0.258 182.19  98.394
## + Channel10    1      0.176 182.27  98.491
## + Channel18    1      0.173 182.27  98.495
## - Channel32    1      3.297 185.74  98.549
## + Channel49    1      0.083 182.36  98.600
## + Channel33    1      0.083 182.36  98.601
## + Channel96    1      0.080 182.37  98.605
## + Channel38    1      0.077 182.37  98.608
## + Channel93    1      0.075 182.37  98.611
## + Channel53    1      0.072 182.37  98.613
## + Channel95    1      0.068 182.38  98.619
## + Channel23    1      0.058 182.39  98.631
## + Channel100   1      0.039 182.41  98.653
## + Channel70    1      0.039 182.41  98.653
## + Channel3     1      0.017 182.43  98.679
## + Channel83    1      0.006 182.44  98.691
## + Channel86    1      0.005 182.44  98.693
## + Channel58    1      0.004 182.44  98.694
## + Channel9     1      0.002 182.44  98.697
## + Channel43    1      0.000 182.44  98.698
## - Channel40    1      3.716 186.16  99.034
## - Channel47    1      4.177 186.62  99.566
## - Channel41    1      4.535 186.98  99.978
## - Channel4     1      5.243 187.69 100.791
## - Channel26    1      5.310 187.75 100.867
## - Channel74    1      6.393 188.84 102.104
## - Channel30    1      6.767 189.21 102.529
## - Channel46    1      7.081 189.53 102.885
## - Channel5     1      7.234 189.68 103.059
## - Channel37    1      7.906 190.35 103.820
## - Channel36    1      8.116 190.56 104.057
## - Channel14    1      8.145 190.59 104.089
## - Channel13    1      8.307 190.75 104.272
## - Channel50    1      9.545 191.99 105.662
## - Channel94    1      9.881 192.32 106.038
## - Channel39    1     10.688 193.13 106.939
## - Channel19    1     10.700 193.15 106.952
## - Channel12    1     11.135 193.58 107.436
## - Channel67    1     11.539 193.98 107.884
## - Channel61    1     13.018 195.46 109.517
## - Channel78    1     13.063 195.51 109.567
## - Channel84    1     13.544 195.99 110.095
## - Channel25    1     13.675 196.12 110.239
## - Channel92    1     14.324 196.77 110.949
## - Channel15    1     14.857 197.30 111.531
## - Channel79    1     15.079 197.52 111.772
## - Channel98    1     15.800 198.25 112.556
## - Channel42    1     16.930 199.37 113.777
## - Channel87    1     17.016 199.46 113.871
## - Channel2     1     17.470 199.91 114.359
## - Channel24    1     17.983 200.43 114.910
## - Channel28    1     18.781 201.23 115.765
```

```
## - Channel34    1    20.096 202.54 117.165
## - Channel59    1    21.118 203.56 118.247
## - Channel29    1    21.758 204.20 118.922
## - Channel51    1    22.492 204.94 119.694
## - Channel64    1    23.624 206.07 120.878
## - Channel81    1    23.835 206.28 121.098
## - Channel1     1    25.375 207.82 122.697
## - Channel68    1    25.592 208.04 122.922
## - Channel99    1    25.708 208.15 123.041
## - Channel20    1    26.532 208.98 123.891
## - Channel56    1    26.908 209.35 124.277
## - Channel80    1    27.151 209.59 124.526
## - Channel63    1    27.775 210.22 125.166
## - Channel60    1    28.584 211.03 125.992
## - Channel69    1    29.529 211.97 126.953
## - Channel85    1    29.676 212.12 127.101
## - Channel73    1    29.855 212.30 127.282
## - Channel22    1    33.331 215.78 130.774
## - Channel71    1    35.977 218.42 133.395
## - Channel55    1    38.327 220.77 135.695
## - Channel52    1    41.196 223.64 138.472
## - Channel45    1    46.331 228.78 143.352
## - Channel54    1    51.083 233.53 147.772
##
## Step:  AIC=95.58
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##     Channel29 + Channel30 + Channel31 + Channel32 + Channel34 +
##     Channel36 + Channel37 + Channel39 + Channel40 + Channel41 +
##     Channel42 + Channel45 + Channel46 + Channel47 + Channel48 +
##     Channel50 + Channel51 + Channel52 + Channel54 + Channel55 +
##     Channel56 + Channel59 + Channel60 + Channel61 + Channel63 +
##     Channel64 + Channel65 + Channel67 + Channel68 + Channel69 +
##     Channel71 + Channel73 + Channel74 + Channel78 + Channel79 +
##     Channel80 + Channel81 + Channel84 + Channel85 + Channel87 +
##     Channel88 + Channel92 + Channel94 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## - Channel31   1     1.683 184.88  95.548
## <none>                     183.19  95.582
## - Channel17   1     1.733 184.93  95.606
## + Channel35   1     1.620 181.57  95.672
## - Channel7    1     1.827 185.02  95.715
## - Channel48   1     2.480 185.68  96.473
## - Channel65   1     2.547 185.74  96.550
## + Channel75   1     0.751 182.44  96.699
## + Channel66   1     0.716 182.48  96.740
## + Channel27   1     0.710 182.49  96.747
## + Channel21   1     0.582 182.61  96.897
## + Channel72   1     0.431 182.76  97.075
## + Channel6    1     0.430 182.76  97.076
## + Channel16   1     0.376 182.82  97.140
```

```
## + Channel95    1     0.320 182.88  97.205
## - Channel11    1     3.128 186.32  97.222
## + Channel89    1     0.274 182.92  97.260
## + Channel90    1     0.236 182.96  97.304
## + Channel18    1     0.234 182.96  97.306
## - Channel32    1     3.208 186.40  97.314
## + Channel10    1     0.215 182.98  97.329
## + Channel38    1     0.207 182.99  97.338
## + Channel100   1     0.199 183.00  97.348
## + Channel97    1     0.179 183.02  97.371
## + Channel33    1     0.175 183.02  97.376
## + Channel82    1     0.173 183.02  97.379
## + Channel62    1     0.160 183.03  97.393
## + Channel44    1     0.151 183.04  97.405
## + Channel57    1     0.124 183.07  97.437
## - Channel8     1     3.342 186.54  97.468
## + Channel70    1     0.090 183.10  97.476
## + Channel91    1     0.077 183.12  97.492
## + Channel58    1     0.068 183.13  97.501
## + Channel23    1     0.043 183.15  97.531
## + Channel53    1     0.026 183.17  97.552
## + Channel93    1     0.018 183.18  97.561
## + Channel43    1     0.013 183.18  97.567
## + Channel76    1     0.008 183.19  97.572
## + Channel83    1     0.007 183.19  97.573
## + Channel96    1     0.006 183.19  97.574
## + Channel9     1     0.006 183.19  97.574
## + Channel3     1     0.005 183.19  97.576
## + Channel77    1     0.001 183.19  97.581
## + Channel86    1     0.001 183.19  97.581
## + Channel49    1     0.000 183.19  97.581
## - Channel88    1     3.544 186.74  97.702
## - Channel47    1     4.214 187.41  98.472
## - Channel4     1     4.556 187.75  98.864
## - Channel40    1     4.585 187.78  98.896
## - Channel41    1     4.938 188.13  99.300
## - Channel26    1     5.402 188.60  99.829
## - Channel46    1     6.508 189.70 101.087
## - Channel5     1     6.653 189.85 101.252
## - Channel14    1     7.883 191.08 102.639
## - Channel13    1     8.140 191.34 102.929
## - Channel30    1     8.207 191.40 103.004
## - Channel36    1     8.216 191.41 103.014
## - Channel37    1     8.348 191.54 103.162
## - Channel50    1     9.462 192.66 104.409
## - Channel74    1     9.473 192.67 104.422
## - Channel94    1    10.036 193.23 105.048
## - Channel19    1    10.527 193.72 105.594
## - Channel12    1    11.066 194.26 106.191
## - Channel67    1    12.025 195.22 107.250
## - Channel39    1    12.591 195.79 107.873
## - Channel84    1    12.880 196.07 108.189
## - Channel78    1    13.001 196.20 108.323
## - Channel92    1    13.631 196.83 109.012
```

```
## - Channel61   1    13.903 197.10 109.308
## - Channel15   1    14.865 198.06 110.356
## - Channel25   1    15.081 198.28 110.590
## - Channel79   1    15.208 198.40 110.728
## - Channel98   1    15.280 198.48 110.806
## - Channel42   1    16.870 200.06 112.521
## - Channel2    1    17.189 200.38 112.863
## - Channel87   1    17.599 200.79 113.303
## - Channel34   1    19.747 202.94 115.591
## - Channel59   1    20.462 203.66 116.347
## - Channel24   1    21.427 204.62 117.363
## - Channel28   1    21.431 204.63 117.367
## - Channel64   1    22.875 206.07 118.879
## - Channel51   1    23.182 206.38 119.200
## - Channel81   1    23.299 206.49 119.321
## - Channel68   1    24.847 208.04 120.927
## - Channel99   1    25.261 208.46 121.354
## - Channel1    1    26.225 209.42 122.346
## - Channel80   1    26.665 209.86 122.798
## - Channel20   1    26.671 209.87 122.804
## - Channel29   1    26.890 210.09 123.028
## - Channel63   1    27.037 210.23 123.179
## - Channel60   1    28.294 211.49 124.460
## - Channel85   1    29.167 212.36 125.346
## - Channel56   1    29.751 212.95 125.936
## - Channel69   1    32.183 215.38 128.378
## - Channel73   1    32.248 215.44 128.443
## - Channel22   1    36.937 220.13 133.072
## - Channel71   1    41.632 224.83 137.609
## - Channel55   1    42.720 225.91 138.647
## - Channel52   1    44.113 227.31 139.969
## - Channel45   1    45.766 228.96 141.527
## - Channel54   1    56.706 239.90 151.561
##
## Step:  AIC=95.55
## tecator_stepAIC$Fat ~ Channel1 + Channel2 + Channel4 + Channel5 +
##     Channel7 + Channel8 + Channel11 + Channel12 + Channel13 +
##     Channel14 + Channel15 + Channel17 + Channel19 + Channel20 +
##     Channel22 + Channel24 + Channel25 + Channel26 + Channel28 +
##     Channel29 + Channel30 + Channel32 + Channel34 + Channel36 +
##     Channel37 + Channel39 + Channel40 + Channel41 + Channel42 +
##     Channel45 + Channel46 + Channel47 + Channel48 + Channel50 +
##     Channel51 + Channel52 + Channel54 + Channel55 + Channel56 +
##     Channel59 + Channel60 + Channel61 + Channel63 + Channel64 +
##     Channel65 + Channel67 + Channel68 + Channel69 + Channel71 +
##     Channel73 + Channel74 + Channel78 + Channel79 + Channel80 +
##     Channel81 + Channel84 + Channel85 + Channel87 + Channel88 +
##     Channel92 + Channel94 + Channel98 + Channel99
##
##              Df Sum of Sq    RSS     AIC
## <none>                    184.88  95.548
## + Channel31   1     1.683 183.19  95.582
## - Channel65   1     1.768 186.65  95.594
## - Channel17   1     2.221 187.10  96.116
```

```
## - Channel7     1      2.385 187.26  96.304
## - Channel32    1      2.433 187.31  96.358
## - Channel48    1      2.494 187.37  96.429
## + Channel35    1      0.948 183.93  96.443
## + Channel75    1      0.896 183.98  96.504
## + Channel66    1      0.884 183.99  96.517
## + Channel21    1      0.847 184.03  96.561
## + Channel6     1      0.701 184.18  96.731
## + Channel38    1      0.412 184.47  97.068
## + Channel10    1      0.322 184.56  97.173
## + Channel97    1      0.290 184.59  97.210
## + Channel33    1      0.270 184.61  97.233
## + Channel95    1      0.250 184.63  97.257
## + Channel27    1      0.241 184.64  97.267
## + Channel89    1      0.235 184.64  97.275
## + Channel18    1      0.231 184.65  97.279
## + Channel16    1      0.213 184.66  97.300
## + Channel23    1      0.187 184.69  97.330
## + Channel100   1      0.187 184.69  97.331
## + Channel62    1      0.184 184.69  97.334
## + Channel70    1      0.165 184.71  97.355
## + Channel82    1      0.165 184.71  97.356
## + Channel72    1      0.156 184.72  97.366
## + Channel90    1      0.155 184.72  97.368
## + Channel58    1      0.130 184.75  97.396
## + Channel77    1      0.118 184.76  97.410
## + Channel43    1      0.097 184.78  97.435
## - Channel11    1      3.380 188.26  97.443
## + Channel57    1      0.064 184.81  97.473
## + Channel93    1      0.043 184.84  97.498
## + Channel44    1      0.024 184.85  97.520
## + Channel91    1      0.023 184.85  97.521
## + Channel49    1      0.013 184.87  97.532
## + Channel53    1      0.013 184.87  97.533
## + Channel83    1      0.008 184.87  97.538
## + Channel9     1      0.008 184.87  97.539
## + Channel76    1      0.007 184.87  97.539
## + Channel86    1      0.005 184.87  97.542
## + Channel96    1      0.003 184.88  97.545
## + Channel3     1      0.003 184.88  97.545
## - Channel8     1      3.535 188.41  97.620
## - Channel88    1      3.728 188.61  97.840
## - Channel4     1      4.102 188.98  98.266
## - Channel40    1      4.306 189.18  98.498
## - Channel47    1      4.650 189.53  98.889
## - Channel26    1      4.837 189.72  99.101
## - Channel41    1      4.903 189.78  99.175
## - Channel5     1      5.827 190.71 100.219
## - Channel46    1      6.001 190.88 100.416
## - Channel36    1      7.246 192.12 101.814
## - Channel37    1      8.009 192.89 102.666
## - Channel13    1      8.375 193.25 103.073
## - Channel14    1      8.461 193.34 103.169
## - Channel19    1      9.917 194.80 104.782
```

```
## - Channel50   1    10.072 194.95 104.953
## - Channel74   1    10.359 195.24 105.269
## - Channel94   1    10.847 195.72 105.806
## - Channel12   1    11.241 196.12 106.238
## - Channel30   1    11.629 196.51 106.663
## - Channel39   1    11.900 196.78 106.960
## - Channel84   1    13.414 198.29 108.607
## - Channel25   1    13.946 198.82 109.183
## - Channel61   1    14.946 199.82 110.262
## - Channel98   1    15.054 199.93 110.378
## - Channel92   1    15.321 200.20 110.666
## - Channel67   1    15.370 200.25 110.718
## - Channel15   1    15.947 200.82 111.336
## - Channel78   1    16.236 201.11 111.645
## - Channel2    1    16.257 201.13 111.668
## - Channel42   1    17.036 201.91 112.499
## - Channel87   1    18.482 203.36 114.033
## - Channel28   1    19.813 204.69 115.436
## - Channel79   1    20.171 205.05 115.811
## - Channel24   1    20.294 205.17 115.941
## - Channel34   1    21.111 205.99 116.795
## - Channel64   1    21.713 206.59 117.423
## - Channel59   1    22.163 207.04 117.890
## - Channel81   1    24.354 209.23 120.154
## - Channel51   1    24.386 209.26 120.186
## - Channel99   1    24.872 209.75 120.685
## - Channel1    1    25.075 209.95 120.893
## - Channel20   1    26.239 211.12 122.081
## - Channel63   1    26.586 211.46 122.435
## - Channel29   1    27.607 212.49 123.471
## - Channel68   1    29.132 214.01 125.008
## - Channel85   1    30.070 214.95 125.948
## - Channel60   1    30.259 215.14 126.137
## - Channel80   1    30.441 215.32 126.319
## - Channel73   1    33.363 218.24 129.217
## - Channel56   1    34.463 219.34 130.298
## - Channel22   1    36.425 221.30 132.212
## - Channel69   1    37.196 222.07 132.960
## - Channel71   1    42.873 227.75 138.387
## - Channel45   1    45.233 230.11 140.603
## - Channel52   1    45.757 230.63 141.092
## - Channel55   1    47.539 232.42 142.748
## - Channel54   1    60.810 245.69 154.686


## The number of parameter selected is: 64
```

In the stepAIC, 64 parameter have been selected as siginficant factor to have a influence on the response variable(i.e Fat). The AIC value is constant for every trial after reaching 95.
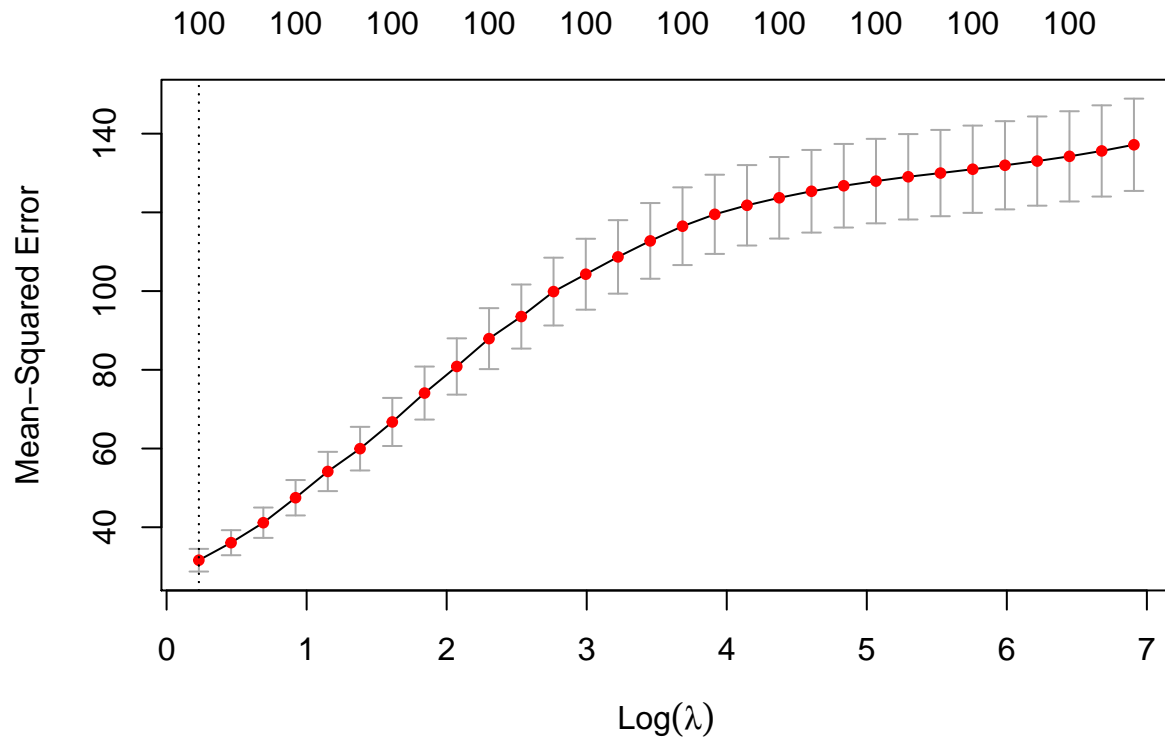
4.5 Ridge Regression
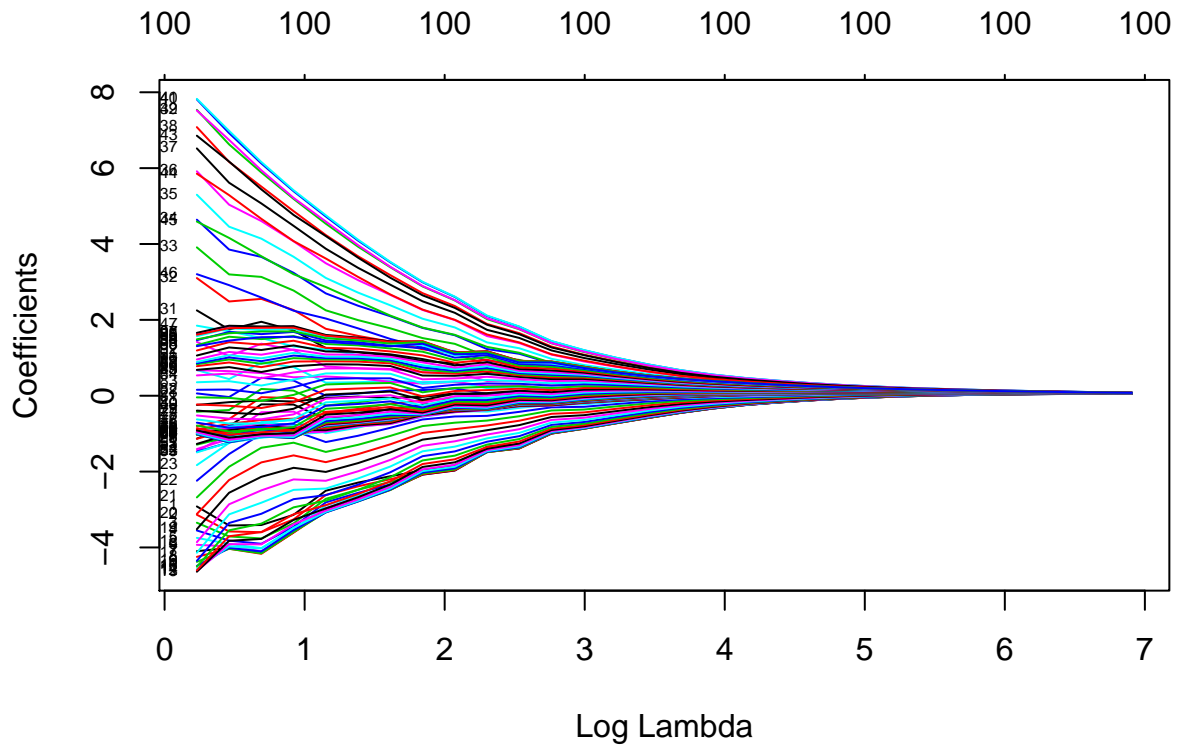


```
## [1] 1.258925
```

```
##
## Call:  glmnet(x = x_var, y = y_var, lambda = lambda_seq, alpha = 0)
##
##      Df   %Dev   Lambda
## 1   100 0.1591 1000.00
## 2   100 0.1691  794.30
## 3   100 0.1779  631.00
## 4   100 0.1856  501.20
## 5   100 0.1925  398.10
## 6   100 0.1989  316.20
## 7   100 0.2052  251.20
## 8   100 0.2112  199.50
## 9   100 0.2182  158.50
## 10  100 0.2257  125.90
## 11  100 0.2345  100.00
## 12  100 0.2450   79.43
## 13  100 0.2567   63.10
## 14  100 0.2714   50.12
## 15  100 0.2900   39.81
## 16  100 0.3131   31.62
## 17  100 0.3385   25.12
```

```
## 18 100 0.3655     19.95
## 19 100 0.3915     15.85
## 20 100 0.4362     12.59
## 21 100 0.4683     10.00
## 22 100 0.5140      7.94
## 23 100 0.5477      6.31
## 24 100 0.5945      5.01
## 25 100 0.6340      3.98
## 26 100 0.6719      3.16
## 27 100 0.7165      2.51
## 28 100 0.7529      2.00
## 29 100 0.7782      1.58
## 30 100 0.8127      1.26
```


When the log(lambda)/lambda is increasing, the model coefficients are moving towards zero.When log(lambda)/lambda is zero,the model coefficients wil become zero. When log(lambda)/lambda is zero, then Ridge regression will be just a linear regression.

4.6 Lasso Regression
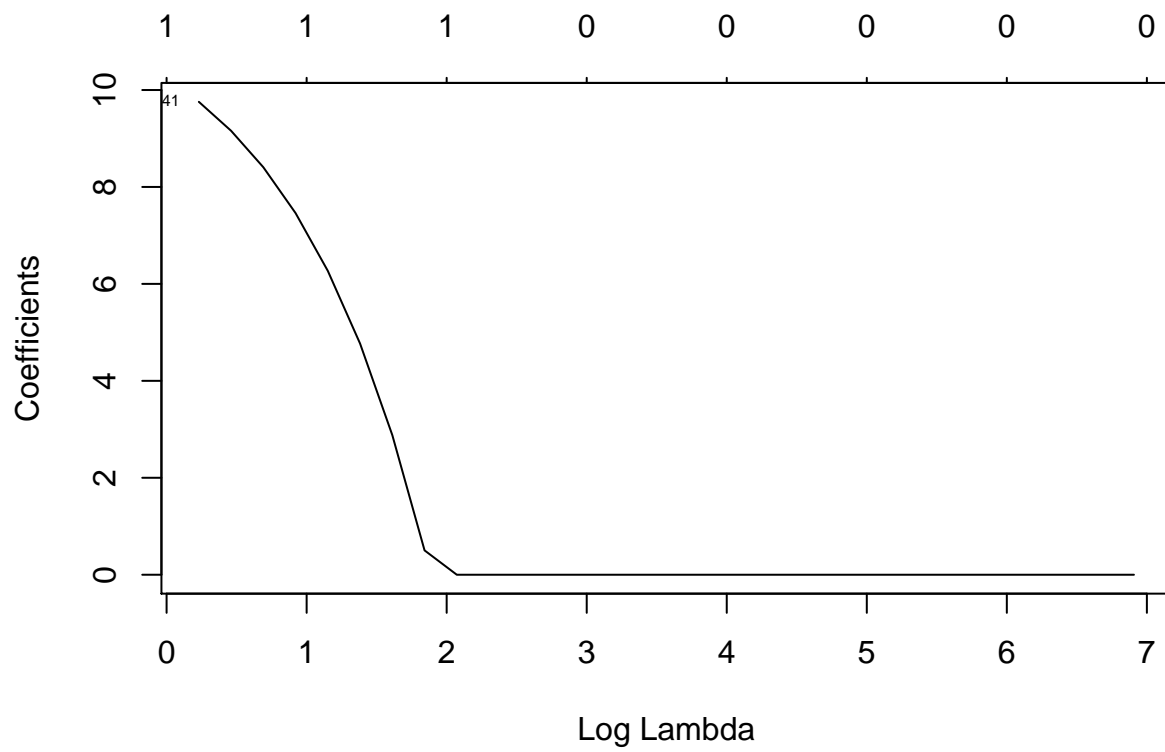

```
## [1] 1.258925
```
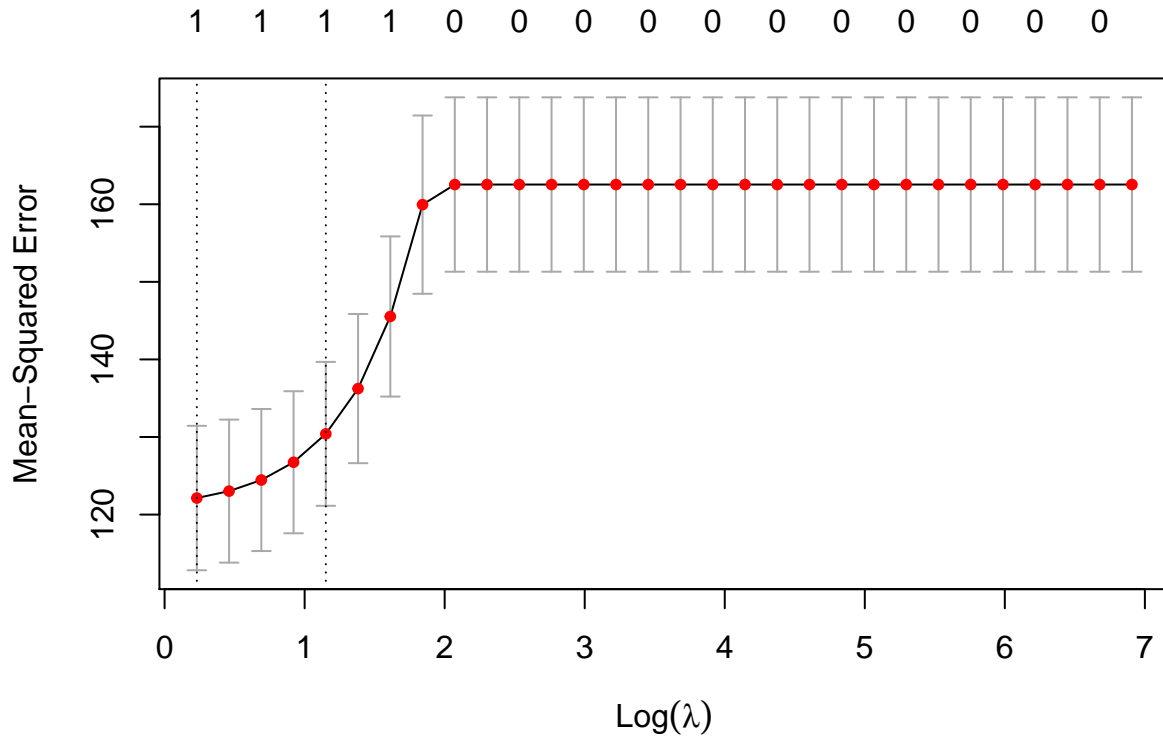
The lasso regression takes more parameters and lasso Refression takes less parameters to form a model. This model with less parameters will remove the problem of overfitting.In lasso regression, the lambda has minimal effect on the coefficient estimates, with a minor contribution to the model, to be exactly equal to zero. This means that, lasso can be considered for reducing the complexity of model by performing variable selection.

4.7 and 4.8

```
##  [1] 6.58364950 5.99877622 5.46586148 4.98028941 4.53785422 4.13472376
##  [7] 3.76740630 3.43272031 3.12776690 2.84990471 2.59672703 2.36604095
## [13] 2.15584840 1.96432877 1.78982321 1.63082025 1.48594268 1.35393562
## [19] 1.23365572 1.12406114 1.02420265 0.93321531 0.85031103 0.77477174
## [25] 0.70594316 0.64322911 0.58608641 0.53402011 0.48657924 0.44335288
## [31] 0.40396663 0.36807935 0.33538019 0.30558594 0.27843853 0.25370282
## [37] 0.23116456 0.21062854 0.19191688 0.17486751 0.15933276 0.14517808
## [43] 0.13228086 0.12052939 0.10982189 0.10006562 0.09117606 0.08307623
## [49] 0.07569597 0.06897135 0.06284412 0.05726123 0.05217430 0.04753928
## [55] 0.04331602 0.03946794 0.03596172 0.03276698 0.02985605 0.02720372
## [61] 0.02478702 0.02258501 0.02057862 0.01875047 0.01708473 0.01556697
## [67] 0.01418404 0.01292397 0.01177584 0.01072971
```

```
## [1] 0.01072971
```
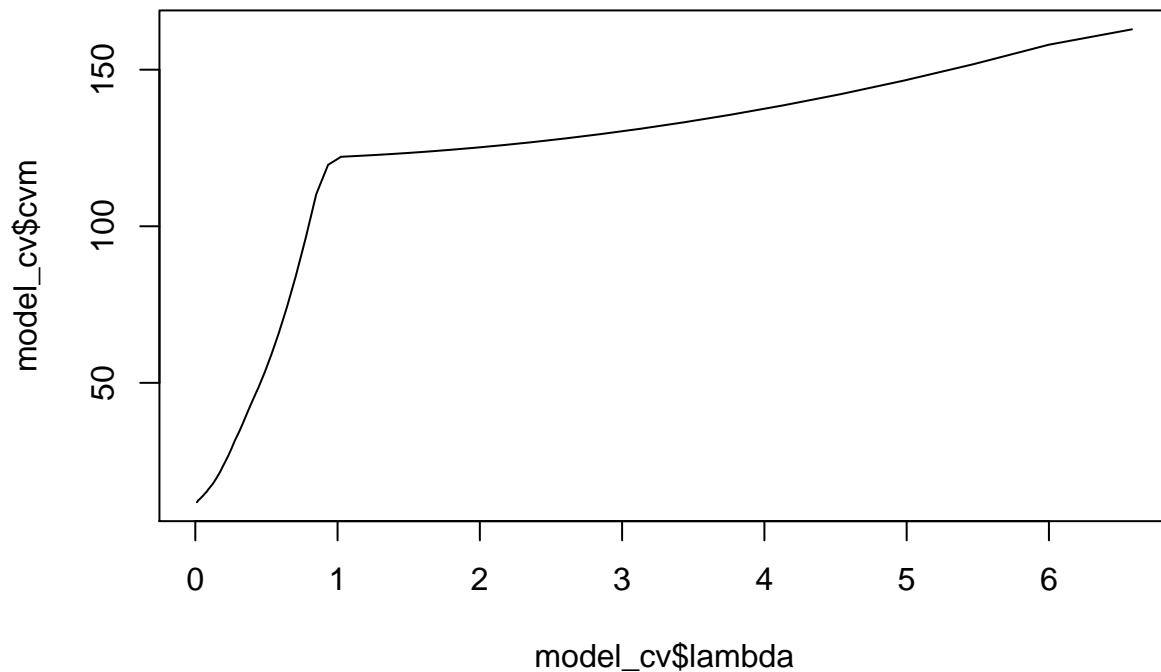
we can interpret that the Cross validation technique chose optimal features of 26 which is less than stepAIC features 64 in fitting an optimal model. The CV technique had an minimal lamda of 0.01072971 where as STEPAIC is an incremental model where the features are removed if it is not making an impact on prediction either starting from 1st variable going in forward direction or from last variable going backward direction or both direction simultaneously and hence 64 features where selected.When lambda is zero and in cv minimal technique, all the 100 parameters as significant factors. Due to lambda equals zero, the absolute value of magnitude will be zero and it will make lasso regression same as linear regression. This will lead to overfitting. So stepAIC is better than cv of lasso when lambda is zero.

Appendix

```
knitr::opts_chunk$set(echo = TRUE)
options(warn = -1)
df <- data.frame(read.csv(file.choose()))
suppressWarnings(RNGversion("3.5.9"))
library(glmnet)
library(kknn)
df1 <- data.frame(read.csv(file.choose()))
df2 <- df1[,2:102]
data(swiss)
set.seed(12345)
n = dim(df)[1]
set.seed(12345)
id=sample(1:n, floor(n*0.5))
```

```r
train=df[id,]
test=df[-id,]
y=test[,49]
model_train <- glm( Spam ~.,family=binomial(link='logit'),data=train)
model_test <- glm(Spam~.,family = binomial(link = 'logit'),data=test)
train_model_prob <- predict(model_train, newx=as.matrix(train), type="response")
train_model_pred <- ifelse(train_model_prob > 0.5,'spam','not a spam')
train_confusion_matrix <- table(train_model_pred,train$Spam)
cat("The confusion matrix for training data with logistics regression:\n")
train_confusion_matrix
miscalculation_rate_train <- 1 - ((sum(diag(train_confusion_matrix))/sum(train_confusion_matrix)))
cat("The misclassification for training data with logistics regression:",miscalculation_rate_train,"\n")
test_model_prob <- predict(model_test, newx=as.matrix(test), type="response")
test_model_pred <- ifelse(test_model_prob > 0.5,'spam','not a spam')
test_confusion_matrix <- table(test_model_pred,test$Spam)
cat("The confusion matrix for testing data with logistics regression:\n")
test_confusion_matrix
miscalculation_rate_test <- 1 - ((sum(diag(test_confusion_matrix))/sum(test_confusion_matrix)))
cat("The misclassification for testing data with logistics regression:",miscalculation_rate_test,"\n")
train_model_pred <- ifelse(train_model_prob > 0.8,'spam','not a spam')
train_confusion_matrix <- table(train_model_pred,train$Spam)
cat("The confusion matrix for training data with logistics regression:\n")
train_confusion_matrix
miscalculation_rate_train <- 1 - ((sum(diag(train_confusion_matrix))/sum(train_confusion_matrix)))
cat("The misclassification for training data with logistics regression:",miscalculation_rate_train,"\n")
test_model_prob <- predict(model_test, newx=as.matrix(test), type="response")
test_model_pred <- ifelse(test_model_prob > 0.8,'spam','not a spam')
test_confusion_matrix <- table(test_model_pred,test$Spam)
cat("The confusion matrix for testing data with logistics regression:\n")
test_confusion_matrix
miscalculation_rate_test <- 1 - ((sum(diag(test_confusion_matrix))/sum(test_confusion_matrix)))
cat("The misclassification for testing data with logistics regression:",miscalculation_rate_test,"\n")
kknn_30tr <- kknn(Spam ~., train, train, k = 30)
kknn_30te <- kknn(Spam ~., test, test, k = 30)
fit <- fitted(kknn_30tr)
fit1 <- fitted(kknn_30te)
kknn_predtr <- ifelse(fit>0.5,1,0)
kknn_predte <- ifelse(fit1>0.5,1,0)
confusion_matrix_kknntr <- table(kknn_predtr,train$Spam)
cat("The confusion matrix for training data with kknn method:\n")
confusion_matrix_kknntr
confusion_matrix_kknnte <- table(kknn_predte,test$Spam)
cat("The confusion matrix for testing data with kknn method:\n")
confusion_matrix_kknnte
miscalculation_rate <- 1 - ((sum(diag(confusion_matrix_kknntr))/sum(confusion_matrix_kknntr)))
cat("The misclassification rate for training data with kknn method:",miscalculation_rate,"\n")
miscalculation_rate3 <- 1 - ((sum(diag(confusion_matrix_kknnte))/sum(confusion_matrix_kknnte)))
cat("The misclassification rate for testing data with kknn method:",miscalculation_rate3,"\n")
kknn_tr <- kknn(Spam ~., train, train, k = 1)
kknn_te <- kknn(Spam ~., test, test, k = 1)
fit <- fitted(kknn_tr)
fit1 <- fitted(kknn_te)
kknn_pred1tr <- ifelse(fit>0.5,1,0)
```

```r
kknn_pred1te <- ifelse(fit1>0.5,1,0)
confusion_matrix_kknntr <- table(kknn_pred1tr,train$Spam)
cat("The confusion matrix for training data with kknn method:\n")
confusion_matrix_kknntr
confusion_matrix_kknnte <- table(kknn_pred1te,test$Spam)
cat("The confusion matrix for testing data with kknn method:\n")
confusion_matrix_kknnte
miscalculation_rate <- 1 - ((sum(diag(confusion_matrix_kknntr))/sum(confusion_matrix_kknntr)))
cat("The misclassification rate for training data with kknn method:",miscalculation_rate,"\n")
miscalculation_rate3 <- 1 - ((sum(diag(confusion_matrix_kknnte))/sum(confusion_matrix_kknnte)))
cat("The misclassification rate for testing data with kknn method:",miscalculation_rate3,"\n")
#3.1
mylin=function(X,Y, Xpred){
  Xpred1=cbind(1,Xpred)
  X=cbind(1,X)
  beta=solve(t(X)%*%X)%*%t(X)%*%Y
  Res=Xpred1%*%beta
  return(Res)
}

myCV=function(X,Y,Nfolds){
  n=length(Y)
  p=ncol(X)

  set.seed(12345)
  ind=sample(n,n)
  print(ind)
  X1=X[ind,]
  print(head(X1))
  Y1=Y[ind]
  print(head(Y1))
  sf=(n/Nfolds)
  MSE=numeric(2^p-1)
  Nfeat=numeric(2^p-1)
  Features=list()
  curr=0

  for (f1 in 0:1)
    for (f2 in 0:1)
      for(f3 in 0:1)
        for(f4 in 0:1)
          for(f5 in 0:1){
            model= c(f1,f2,f3,f4,f5)
            if (sum(model)==0) next()
            SSE=0

            for (k in 1:Nfolds){
              indices<-(((k-1)*sf)+1):(k*sf)
              X_test<-X1[indices,which(model==1)]
              X_train<-X1[-indices,which(model==1)]
              Yp<-Y1[indices]
              Y_train<-Y1[-indices]
              Ypred<-mylin(X_train,Y_train,X_test)
```

```r
            SSE=SSE+sum((Ypred-Yp)^2)
          }
          curr=curr+1
          MSE[curr]=SSE/n
          Nfeat[curr]=sum(model)
          Features[[curr]]=model
        }
  plot(MSE,Nfeat)
  i=which.min(MSE)
  return(list(CV=MSE[i], Features=Features[[i]]))
}
#3.2
f <- myCV(X=as.matrix(swiss[,2:6]),Y=swiss[[1]],Nfolds=5)
f
#4.1
Model <- lm(df1$Moisture ~ df1$Protein)
plot(df1$Protein,df1$Moisture,type = "p",xlab = "Moisture",ylab = "Protien",main = "Moisture Vs Protein"
abline(lm(df1$Moisture ~ df1$Protein), col = "blue")
#4.2
n=dim(df1)[1]
set.seed(12345)
id = sample(1:n, floor(n*0.5))
train=df1[id,]
test=df1[-id,]
Model <-  list()
Bias <- vector()
Variance <- numeric(6)
MSE <- vector()
Y <- numeric(6)

for(i in 1:6)
{
  Model$i <- lm(Moisture ~ poly(Protein,i), data = train)
  Y <- predict(Model$i,train,type = "response")
  Bias[i] <- mean(Y) - mean(train$Moisture)
  Variance[i] <- var(Y)
  MSE[i] <- mean((train$Moisture - Y)^2)
}
plot(x = Bias, y = Variance, main = "Bias-Variance tradeoff",type = "l")
#4.3
n=dim(df1)[1]
set.seed(12345)
id = sample(1:n, floor(n*0.5))
train=df1[id,]
test=df1[-id,]
Model_val <-  list()
Bias_val <- vector()
Variance_val <- numeric(6)
MSE_val <- vector()
Y_val <- numeric(6)
#Prediction for Validate data
for(i in 1:6)
{
```

```r
  Model_val$i <- lm(Moisture ~ poly(Protein,i), data = train)
  Y_val <- predict(Model_val$i,newdata = test,type = "response")
  Bias_val[i] <- mean(Y_val) - mean(test$Moisture)
  Variance_val[i] <- var(Y_val)
  MSE_val[i] <- mean((test$Moisture - Y_val)^2)
}
plot(x=c(1:6),type="l",y=MSE_val, xlab = "i", ylab = "MSE",col = "green",main = "Plot showing how train
points(x=c(1:6),type = "l",y=MSE,col = "red")
legend("topright",c("Validation","Training"),col=c("red","green"),lty = c(1,1))
plot(x = Bias_val, y = Variance_val, main = "Bias-Variance tradeoff",type = "l")
#4.4
tecator_stepAIC <- df1[,2:102]
stepAIC_fit <- lm(tecator_stepAIC$Fat ~. ,data =tecator_stepAIC )
step <- MASS::stepAIC(stepAIC_fit,direction = "both")
final_model <- step$anova
step_sm <- summary(step)
cat("The number of parameter selected is:",length(coef(step)),"\n")
#4.5
x_var <- data.matrix(df2[,1:100])
y_var <- df2[,"Fat"]
lambda_seq <- 10^seq(0.1,3,0.1)
fit <- glmnet(x_var, y_var, alpha = 0, lambda  = lambda_seq)
plot(fit,xvar = "lambda",label = TRUE)
ridge_cv <- glmnet::cv.glmnet(x_var, y_var, alpha = 0, lambda = lambda_seq)
best_lambda <- ridge_cv$lambda.min
best_lambda
best_fit <- ridge_cv$glmnet.fit
ridge_cv$glmnet.fit
plot(ridge_cv,type = 'l')


#4.6
x_var <- data.matrix(df2[,1:100])
y_var <- df2[,"Fat"]
lambda_seq <- 10^seq(0.1,3,0.1)
lambda_seq[length(lambda_seq)+1] = 0
fit <- glmnet(x_var, y_var, alpha = 1, lambda  = lambda_seq)
plot(fit,xvar = "lambda",label = TRUE)
lasso_cv <- cv.glmnet(x_var, y_var, alpha = 1, lambda = lambda_seq,standardize = T,nfolds = 10)
best_lambda <- lasso_cv$lambda.min
best_lambda
best_fit <- lasso_cv$glmnet.fit
plot(lasso_cv,type = 'l')


#4.7 and # 4.8
model_cv <- cv.glmnet(x_var, y_var, alpha = 1, type.measure = "mse")
b_lambda <- model_cv$lambda.min
model_cv$lambda
b_lambda
lasso_best <- glmnet(x=x_var, y=y_var,alpha=1, lambda = b_lambda)
cv_score <- cbind(model_cv$lambda,model_cv$cvm)
min_cv <- cv_score[which(cv_score[,1] == model_cv$lambda.min),2]
optimal_features <- as.matrix(coef(lasso_best))
total_optimal_features <- length(which(optimal_features[,1] !=0))
```

```r
plot(model_cv$lambda,model_cv$cvm,type = 'l')
```