Problem Statement Analysis of the South Africa Heart Disease data using SVM.

```
## Warning: package 'ElemStatLearn' was built under R version 3.2.5
```

```
## Warning: package 'e1071' was built under R version 3.2.5
```

```
## Warning: package 'kernlab' was built under R version 3.2.5
```

Linear Kernel For Support vector algorithm we try to find the best model using cross validation. Keeping cost as a varibale changing it from 0.01 to 1000, we find the best model for Linear Kernel.

```
##
## Parameter tuning of 'svm':
##
## - sampling method: 10-fold cross validation
##
## - best parameters:
##  cost
##   0.1
##
## - best performance: 0.2774746
##
## - Detailed performance results:
##    cost      error dispersion
## 1 1e-02 0.2946346 0.07492967
## 2 1e-01 0.2774746 0.08442309
## 3 1e+01 0.2860777 0.08439008
## 4 1e+02 0.2860777 0.08439008
## 5 1e+03 0.2860777 0.08439008
```

Radial Kernel For Support vector algorithm we try to find the best model using cross validation. Keeping cost as a varibale changing it from 0.01 to 1000, we find the best model for Radial Kernel.

```
##
## Parameter tuning of 'svm':
##
## - sampling method: 10-fold cross validation
##
## - best parameters:
##  cost
##    10
##
## - best performance: 0.3186864
##
## - Detailed performance results:
##    cost      error dispersion
## 1 1e-02 0.3463922 0.05461891
## 2 1e-01 0.3463922 0.05461891
## 3 1e+01 0.3186864 0.07810645
## 4 1e+02 0.3834875 0.08943147
## 5 1e+03 0.3855689 0.06758995
```

Polynomial Kernel For Support vector algorithm we try to find the best model using cross validation. Keeping cost as a varibale changing it from 0.01 to 1000, we find the best model for Polynomial Kernel.

```
##
## Parameter tuning of 'svm':
##
## - sampling method: 10-fold cross validation
##
## - best parameters:
##  cost
##   0.1
##
## - best performance: 0.2623959
##
## - Detailed performance results:
##    cost      error dispersion
## 1 1e-02 0.3355689 0.05851963
## 2 1e-01 0.2623959 0.09155618
## 3 1e+01 0.3230342 0.08790004
## 4 1e+02 0.3729880 0.09928221
## 5 1e+03 0.4096207 0.09700818
```

RESULT We find the least error with Polynomial Kernel with 3 degrees and Cost as 0.1.