final_project

R. Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
data = read.table("player time.csv"
                    ,header=TRUE
                    , row.names=NULL
                    ,sep = ","
                    ,fill = TRUE)
dataMatch = read.table("match.csv"
                          ,header=TRUE
                          , row.names=NULL
                          ,sep = ","
                          ,fill = TRUE)
#Create dataframes
df <- data.frame(data)</pre>
dfMatch <- data.frame(dataMatch)</pre>
#Remove all O rows at match start
df \leftarrow df[!(df$times == 0),]
#Remove different gamemodes
dfMatch<- dfMatch[(dfMatch$game mode == 22),]</pre>
dfMatch <- dfMatch[,!(colnames(dfMatch) %in% c("negative_votes","positive_votes","cluster"))]</pre>
#Sum of teams Gold
RadiantGold <- df$gold_t_0 + df$gold_t_1 + df$gold_t_2 + df$gold_t_3 + df$gold_t_4
df$RadiantGold <- RadiantGold</pre>
\label{eq:radiantGoldSD} $$\operatorname{Ty}(df[,c("gold_t_0","gold_t_1","gold_t_2","gold_t_3","gold_t_4")],1,sd) $$
df$RadiantGoldSD <- RadiantGoldSD</pre>
RadiantGoldMAD <-apply(df[,c("gold_t_0","gold_t_1","gold_t_2","gold_t_3","gold_t_4")],1,mad)
df$RadiantGoldMAD <- RadiantGoldMAD</pre>
DireGold <- df$gold_t_128 + df$gold_t_129 + df$gold_t_130 + df$gold_t_131 + df$gold_t_132
df$DireGold <- DireGold</pre>
#Sum of teams XP
RadiantXp <- df_{xp_t_0} + df_{xp_t_1} + df_{xp_t_2} + df_{xp_t_3} + df_{xp_t_4}
df$RadiantXp <- RadiantXp</pre>
\label{eq:radiantXpSD} $$$ $$ $$ -apply(df[,c("xp_t_0","xp_t_1","xp_t_2","xp_t_3","xp_t_4")],1,sd) $$
df$RadiantXpSD <- RadiantXpSD</pre>
{\tt RadiantXpMAD} < -apply(df[,c("xp_t_0","xp_t_1","xp_t_2","xp_t_3","xp_t_4")],1,mad)
df$RadiantXpMAD <- RadiantXpMAD</pre>
```

```
DireXp \leftarrow df_{xp_t_128} + df_{xp_t_129} + df_{xp_t_130} + df_{xp_t_130} + df_{xp_t_132} + df_{xp_t_132}
df$DireXp <- DireXp</pre>
#Team Advantages
df$RadiantGoldAdv <- df$RadiantGold - df$DireGold</pre>
df$DireGoldAdv <- df$DireGold - df$RadiantGold
df$RadiantXpAdv <- df$RadiantXp - df$DireXp</pre>
df$DireXpAdv <- df$DireXp - df$RadiantXp</pre>
#Merge match results with match flow
matchSoT <- merge(df,dfMatch, by ="match_id")</pre>
matchSoT$radiant_win <- matchSoT$radiant_win == "True"</pre>
matchSoT$dire_win <- !matchSoT$radiant_win</pre>
#Get match status @15minutes to predict Win%
match15 <- matchSoT[(matchSoT$times == 900),]</pre>
   #Use Advantages
   match15Adv <- match15[,c("match_id","RadiantXpAdv","RadiantGoldAdv","RadiantGoldSD","RadiantGoldMAD"</pre>
#Use Advantages
matchTableau <- matchEvery5[,c("match_id","times","RadiantXpAdv","RadiantGoldAdv","radiant_win")]</pre>
#library(ggplot2)
\#ggplot(data = dat\$game\_mode, mapping = aes(x = value)) +
# geom_histogram(bins = 10) + facet_wrap(~variable, scales = 'free_x')
#Predicting
```

Including Plots

You can also embed plots, for example:

Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

```
## Observations: 48,591
## Variables: 7
## $ RadiantXpAdv
               <int> 1238, -1224, 1470, 2822, 5261, 5683, 5274, 7572...
## $ RadiantGoldAdv <int> 707, -193, 1035, 2464, 6967, 5311, 1409, 7476, ...
## $ RadiantGoldSD <dbl> 1448.1475, 1779.8793, 1110.6335, 1023.3632, 196...
## $ RadiantGoldMAD <dbl> 690.8916, 2014.8534, 598.9704, 1146.0498, 2283....
## $ RadiantXpSD
               <dbl> 1761.8006, 2318.0925, 1094.7780, 963.0772, 2003...
## $ RadiantXpMAD
               <dbl> 1925.8974, 2892.5526, 1438.1220, 1254.2796, 311...
## $ radiant_win
               <lgl> TRUE, FALSE, FALSE, TRUE, TRUE, TRUE, TR...
##
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    ##
##
    ##
```

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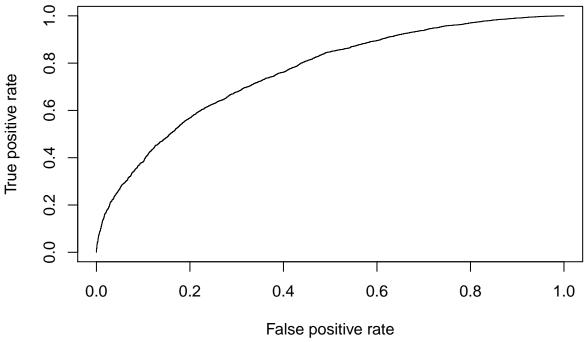
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## [41039] 1 1 1 0 1 0 1 0 0 1 1 1 0 0 1 0 1 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 1 0
## [41073] 0 1 0 0 0 1 0 1 0 1 0 1 0 1 1 1 0 0 1 0 0 0 0 0 1 1 0 0 1 1 0 1 0 0
## [41107] 1 1 1 0 0 0 0 0 1 0 0 1 0 1 0 0 1 0 0 1 1 1 0 0 0 0 0 1 1 0 1 0 0 1
## [41141] 1 0 0 1 1 1 0 0 0 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 1 1 0 0 1 1 1 0 1 0 0
## [41175] 1 1 1 1 0 0 0 1 0 0 1 0 1 0 1 1 0 0 1 0 1 0 1 0 0 0 0 0 0 1 1 1 1 1 1
## [41277] 1 0 1 0 1 0 1 1 1 1 0 0 0 0 0 1 0 1 1 1 0 1 0 1 0 1 1 1 1 1 1 0 0 1 0 0
## [41345] 1 0 1 0 1 1 1 1 1 0 1 0 0 1 0 0 0 1 1 0 1 1 0 0 1 0 0 1 1 0 1 1 1 1 0
## [41379] 1 1 0 1 1 1 1 0 1 0 1 1 0 0 0 1 1 0 0 1 0 0 1 0 0 0 1 1 0 0 0 1 1
## [41413] 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 0 0 1 0 0 1 0 1 1 1 1 0 0 1 1 1 1 1
## [41447] 0 1 0 1 0 1 1 1 0 1 0 0 1 0 0 1 1 1 0 1 0 0 0 1 1 1 0 0 0 1 1 1 1
## [41481] 0 0 0 1 1 1 1 1 1 1 0 1 1 0 0 1 1 0 0 1 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1
## [41515] 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 1 1 0 0 1 0 0 1 0 1 0 1 1 1 1 0
## [41549] 0 1 0 0 1 1 1 1 1 0 1 1 0 0 0 1 1 1 0 0 0 0 1 1 0 1 1 0 1 0 1 0 1 0
## [41583] 1 1 1 0 0 0 1 0 1 1 1 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 1 0 1 1 0 1 0 1
## [41617] 1 1 0 1 0 0 1 1 1 1 1 0 0 1 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 1 1 1 0 0
## [41651] 0 1 1 0 0 0 1 1 0 0 0 1 1 1 0 0 1 1 1 1 0 0 1 1 1 1 0 1 0 1 1 1 1 0 0 1 1 1 1 1 1
## [41685] 0 1 0 1 0 1 0 0 0 1 1 0 0 1 0 1 0 1 1 1 1 1 1 1 1 0 0 1 1 0 1 1
## [41753] 1 1 0 0 1 0 0 1 0 1 0 1 1 1 1 1 1 0 0 1 0 1 0 1 1 1 0 1 1 0 1 1 0 0 0
## [41787] 1 0 0 0 1 0 1 1 0 1 0 1 0 1 0 0 1 1 1 0 0 1 1 0 1 1 1 0 0 1 1 1 1
## [41855] 1 1 1 0 0 1 1 0 1 0 1 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 1
## [41923] 1 1 1 0 0 1 0 0 1 0 1 1 1 0 0 0 0 0 1 0 0 0 1 1 0 0 0 1 1 0 1 1 1 1
## [41957] 1 0 1 1 1 0 1 1 0 0 1 0 1 0 1 1 0 0 0 0 1 0 1 1 0 1 0 0 0 1 0 0 1 0 0
## [41991] 1 0 0 0 1 0 1 1 1 1 0 1 1 0 0 1 0 1 1 0 1 0 1 0 1 1 1 1 1 0 0 0 0 1
## [42025] 0 1 0 0 0 1 0 1 0 1 1 1 0 0 0 0 0 0 1 0 0 1 1 0 0 1 0 1 0 1 0 0 1 1 0
## [42059] 1 1 0 1 1 1 1 1 1 1 1 0 0 0 0 1 1 0 0 1 1 1 1 1 1 0 0 0 0 1 1 1
## [42093] 1 0 0 0 1 1 1 1 1 1 1 0 0 1 1 1 1 1 0 1 0 1 1 1 0 1 0 1 1 0 0 0 1 1 0 0 1 1 0
## [42161] 1 1 1 1 1 0 0 0 1 0 0 0 0 1 0 0 0 1 1 1 1 1 1 0 1 1 1 1 1 0 1 0 1 0 1
## [42195] 0 0 0 0 0 1 1 0 0 0 0 0 0 1 0 1 0 1 1 1 1 1 1 0 0 1 0 0 0 1 1 1
## [42229] 0 0 1 1 1 0 0 0 1 0 1 1 1 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1 1 0 0 1 1 1 1
## [42297] 0 0 0 1 0 1 0 1 0 1 1 0 0 1 0 0 0 0 1 1 0 1 1 1 1 0 0 0 0 0 1 1 1 1
## [42331] 0 0 1 0 0 1 1 0 1 0 1 0 1 0 1 0 0 1 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 1
```

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## [42365] 1 1 0 0 0 1 1 0 0 1 0 0 1 1 1 0 0 1 0 0 1 1 0 0 0 1 1 0 1 0 1 1 1 1 1
## [42399] 0 0 0 1 0 1 0 1 1 1 0 1 1 1 1 0 1 0 0 1 0 1 0 1 1 0 0 0 1 0 1 1 1
## [42467] 0 1 1 1 0 1 1 0 0 1 1 1 1 0 0 0 0 1 0 0 0 1 1 0 1 1 1 0 1 1 1 1 1 1 1
## [42501] 1 1 1 0 0 0 1 0 1 1 1 1 0 0 0 0 0 1 1 0 1 0 0 0 0 1 1 1 0 1 0 0
## [42535] 1 1 1 0 0 0 1 1 1 0 1 0 1 1 0 0 1 0 0 0 1 1 1 0 0 0 0 0 1 1 1 0 0 0
## [42637] 0 1 0 0 1 0 1 0 1 0 1 0 1 0 0 0 0 1 1 1 1 0 1 1 0 1 1 1 0 1 1 0 1 0 1
## [42671] 1 0 0 0 1 0 0 1 0 1 1 0 0 0 1 1 0 0 1 1 0 1 1 1 1 1 1 1 0 1 0 1 0 0 0
## [42705] 1 0 1 0 1 1 1 0 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 0 0 1 1 0 0
## [42739] 1 0 1 1 1 0 1 0 1 0 0 0 0 0 1 1 0 0 0 0 0 1 1 1 1 1 1 1 1 0 1 0 0 0 0
## [42773] 1 1 1 0 1 0 1 0 1 0 0 0 1 1 0 1 1 0 0 0 1 1 0 0 1 1 1 1 1 1 1 1 0 1 1 0
## [42807] 0 0 1 1 0 1 1 1 1 1 1 0 0 1 0 1 1 0 1 0 0 0 1 0 1 0 1 0 1 0 1 0 0
## [42841] 1 1 1 1 1 0 1 1 1 0 0 1 1 1 1 1 0 0 0 1 0 0 0 1 0 0 1 1 1 1 0 0 1 1 0
## [42875] 1 1 0 0 1 1 1 0 0 1 1 0 1 1 0 1 1 0 1 1 0 0 0 1 0 0 1 0 0 0 0 1 1
## [42977] 0 1 1 0 0 1 1 1 0 0 0 0 0 0 1 1 1 0 0 1 1 0 0 0 1 0 0 1 0 1 0 1 0 1 0 0
## [43045] 0 1 0 1 1 0 0 1 0 1 1 0 0 1 1 0 1 1 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 1 1
## [43079] 0 1 0 0 1 0 0 0 0 0 1 1 1 0 0 1 0 0 0 1 1 0 1 1 0 1 1 1 0 0 0 0 0 1
## [43147] 1 1 0 1 0 1 1 0 1 0 0 0 1 1 0 1 0 0 0 0 1 0 1 0 1 0 1 1 1 1 1 1 0 0 1
## [43181] 1 1 1 1 1 1 1 1 0 0 1 1 0 1 0 1 1 1 0 1 1 0 0 1 1 1 0 0 1 1 1 0 0 0
## [43215] 1 0 0 0 0 1 0 1 0 1 1 1 1 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 0 1
## [43385] 0 1 0 0 0 0 1 0 1 1 0 1 1 1 1 1 1 0 1 0 1 1 1 1 0 0 0 0 1 0 1 0 0 1 1 1
## [43419] 1 1 0 0 1 0 0 0 0 0 1 0 1 1 1 1 0 0 0 0 0 0 0 1 1 0 1 1
## [43453] 0 1 0 0 0 1 0 1 0 0 1 0 1 1 1 1 1 1 0 0 0 0 1 0 1 1 0 0 0 1 0 1 0 0
## [43487] 0 0 0 0 0 1 0 1 0 0 0 0 1 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 0 1 1 0 1 1 0
## [43521] 0 0 1 0 1 1 0 1 0 0 0 1 0 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 1 0 1 0 1 0 1 0 1 0
## [43589] 1 1 0 0 1 0 0 1 1 1 1 1 1 0 1 0 0 1 0 1 0 1 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1
## [43657] 1 1 0 1 1 1 1 1 1 1 0 0 1 1 0 1 1 0 0 0 0 0 1 0 0 1 0 1 1 1 0 0 0 1
## [43691] 0 1 0 1 0 1 1 1 1 1 1 0 1 0 1 1 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 1 1 1
## [43759] 0 0 1 0 1 0 1 1 0 0 1 0 0 1 0 1 0 0 0 1 0 0 0 1 0 0 1 1 1 1 1 1 0 0 0
## [43793] 0 0 0 1 0 1 0 0 0 1 0 0 1 1 1 1 0 0 1 0 1 0 1 1 1 0 0 1 0 1 1 1 0 1 1 1 0 1 0 1 1
## [43827] 1 1 1 0 1 1 1 0 0 1 1 1 1 1 1 1 0 0 1 1 0 0 0 0 1 1 0 0 0 0 0 1 0 1
## [43895] 1 1 0 0 1 1 0 1 1 0 1 0 1 1 1 1 1 0 0 1 0 1 0 1 1 0 0 0 0 1 0 0 0 1 0
## [43929] 0 1 0 1 0 1 0 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 0 1 0 1 1
## [43963] 0 0 0 1 0 0 1 1 1 1 1 1 0 0 1 0 0 1 0 0 1 1 0 1 0 0 0 0 1 1 1 0 1 1 1
## [44031] 0 0 0 0 1 1 1 0 0 0 1 0 1 0 1 0 1 1 1 0 1 1 0 1 1 0 0 0 1 0 0 1
## [44065] 1 0 1 1 0 1 1 1 1 1 0 1 1 1 1 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 1 1 0 1 0
## [44099] 1 0 0 0 1 1 0 0 1 1 1 1 1 1 0 0 0 1 0 1 1 0 0 1 1 0 1 0 0 0 1 0 1 1 1
## [44133] 1 0 0 1 0 0 0 0 1 1 1 1 1 0 1 0 0 0 1 1 1 1 1 0 0 1 0 1 1 1 1 1 0 0 1
## [44167] 1 0 0 0 0 1 0 1 0 0 1 0 1 0 0 0 0 1 1 1 1 0 0 1 0 0 0 0 1 0 0 1 0 0 1
```

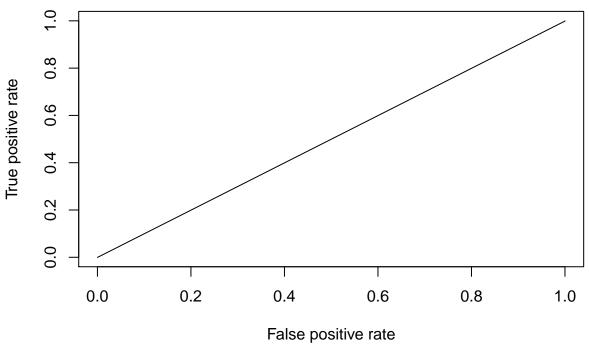
```
## [44235] 1 0 1 1 1 1 1 1 0 0 1 0 0 1 1 0 0 0 1 1 0 1 1 1 1 1 0 1 1 0 1 1 1 1 1
## [44269] 1 1 1 1 1 1 0 0 0 0 1 0 1 0 0 0 0 0 1 1 1 0 0 1 1 1 1 1 0 1 1 1 0 1
## [44303] 1 1 1 1 1 0 1 1 1 0 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 1
## [44337] 0 1 1 1 0 1 0 0 1 0 0 1 0 1 1 0 1 0 0 0 0 0 1 0 0 1 1 1 0 1 1 0 0 1
## [44371] 1 0 0 1 1 0 1 0 1 0 1 0 0 0 1 1 1 1 0 1 1 1 0 1 0 0 0 1 0 1 0 1 0 1 1
## [44405] 1 1 0 0 1 0 1 0 1 1 1 1 0 1 0 1 0 0 0 1 0 0 0 0 1 0 1 0 1 0 0 0 1 1 0
## [44439] 1 1 0 1 1 0 0 0 0 1 0 0 0 1 0 0 1 0 0 0 0 1 0 1 0 1 1 0 0 1 1 0 1
## [44473] 1 1 1 1 1 1 0 0 1 1 0 0 1 0 1 1 0 0 0 1 0 1 1 1 1 0 1 0 0 0 0 1 1
## [44541] 1 1 0 1 1 0 1 0 1 0 0 0 0 0 0 1 1 0 1 1 1 1 0 1 1 1 0 0 1 0 0 0 1 0
## [44575] 0 0 1 0 0 1 1 1 0 1 0 1 0 1 1 1 1 0 0 0 1 1 1 1 1 0 1 1 1 1 0 0 1 1 0
## [44609] 0 0 1 1 0 0 1 0 0 0 1 0 0 0 1 0 1 0 0 1 0 1 0 0 1 1 1 0 1 0 0 0 1 0 0
## [44643] 0 0 1 0 1 1 0 0 0 0 1 1 1 1 0 1 0 0 0 1 0 0 0 0 0 0 0 0 1 0 0 0 1
## [44677] 0 1 0 1 0 0 1 1 1 1 0 0 1 1 1 1 1 0 0 0 1 0 1 1 0 0 1 0 0 1 0 1 0 0 1
## [44711] 0 1 0 1 0 0 1 1 1 1 1 0 0 1 1 1 1 0 0 0 0 0 1 0 0 0 0 0 1 1 1 1 1 0 1 1
## [44745] 0 1 1 0 1 1 0 0 0 0 1 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 1 1 0 1 0 0 0 0
## [44779] 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 1 1 1 0 0 0 0 0 0 1 1 1 0 0 0 0
## [44813] 1 1 0 1 1 0 1 0 1 0 1 0 1 1 0 1 1 1 0 0 0 1 1 0 0 1 0 0 1 0 1 1 1 1 1 1 0
## [44915] 0 0 1 1 0 1 0 0 1 1 1 0 1 1 1 1 0 0 0 0 1 0 1 0 1 0 1 1 0 0 1 1 0 1
## [45017] 1 1 1 0 0 1 1 1 0 1 0 1 0 1 1 1 0 0 1 0 1 0 0 0 0 0 0 0 1 1 0 1 1 0
## [45119] 0 1 0 0 0 1 1 0 1 0 0 0 1 1 1 1 1 1 0 1 0 1 0 1 1 0 0 0 0 1 1 1 1 1 1
## [45153] 0 1 0 0 1 1 1 1 0 1 0 0 0 1 0 0 0 1 1 0 1 1 1 1 0 1 1 1 0 1 1 1 0 1
## [45187] 0 1 0 0 1 1 0 0 0 1 0 1 0 0 0 0 0 0 1 0 0 1 1 0 0 0 1 0 0 1 1 0 1 1
## [45221] 0 1 1 1 1 0 0 1 0 1 1 1 1 0 0 1 0 0 1 1 1 1 1 0 0 1 1 1 1 1 0 0 1 0 0 0 1 1
## [45255] 0 0 1 0 1 1 1 1 0 0 1 1 1 1 1 0 1 1 0 1 1 0 1 1 1 0 0 0 1 0 1 1 1 0 1
## [45289] 0 0 1 1 0 0 1 0 0 1 0 0 1 1 0 1 1 0 1 0 1 0 0 1 0 0 0 0 0 1 0 0 1 0 0 1
## [45323] 0 1 0 0 1 1 1 0 1 0 0 0 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 1 0
## [45425] 0 0 0 0 1 0 1 0 1 1 0 1 0 0 1 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 0 0 1 1
## [45459] 1 0 0 1 0 0 0 0 1 1 1 1 1 0 0 1 0 0 1 0 1 0 1 0 0 0 1 0 0 1 0 1 0 1 0
## [45561] 0 0 0 1 1 0 1 0 1 0 0 0 0 0 1 1 0 1 1 1 1 1 1 1 0 0 1 0 0 1 1 0 1 1 0
## [45595] 0 1 1 0 0 0 0 1 0 1 1 1 1 0 0 0 0 1 1 1 1 1 1 0 1 0 1 0 1 0 1 1 1 1 1
## [45629] 0 0 0 1 0 0 0 0 1 1 1 1 1 1 1 1 1 0 1 0 0 0 1 1 1 1 1 0 0 0 1 0 1 0 0
## [45731] 0 0 1 0 0 0 0 0 1 0 0 1 1 1 0 1 1 1 0 1 0 1 1 1 0 1 0 1 0 1 1 1 0 1
## [45765] 0 1 0 0 1 1 1 1 0 0 0 0 0 1 0 0 1 1 1 1 1 1 0 0 1 0 1 0 1 1 1 0 1 1 0
## [45833] 1 0 0 1 1 1 0 0 1 1 0 1 1 0 1 0 0 1 1 1 0 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0
## [45867] 0 0 1 1 1 0 0 0 0 0 1 1 1 0 1 0 1 1 1 0 0 1 1 1 0 1 1 1 0 0 0 1 1 1 1
## [45935] 1 0 0 1 0 0 0 0 0 0 1 0 0 1 0 0 1 0 0 1 1 0 1 1 0 0 1 1 0 0 1 0 1 0 1
## [45969] 1 0 0 0 1 1 0 0 1 0 1 0 1 0 1 0 1 1 1 0 1 0 1 1 1 1 1 1 1 0 0 1
## [46003] 0 0 0 1 1 1 0 1 1 1 1 1 1 0 0 0 1 1 0 1 1 0 1 1 1 1 0 1 1 1 0 1 0 0 0
```

```
## [46037] 0 1 0 1 1 1 1 0 1 1 1 0 0 1 1 1 1 0 0 1 0 0 0 0 1 1 0 0 1 0 0
## [46071] 0 0 1 1 1 1 1 1 1 1 1 1 1 0 1 1 0 0 0 0 0 0 0 1 1 1 1 1 1 0 1 1 0
## [46105] 0 0 1 0 0 1 0 1 1 0 1 0 0 0 1 0 1 0 0 0 1 0 0 0 1 1 0 0 0 1 1 1 0 0 0
## [46139] 1 1 0 0 0 1 0 0 0 1 0 1 0 1 1 1 1 0 1 1 0 0 1 1 1 1 1 1 1 1 1 0 0 1 1 1
## [46173] 0 1 1 0 1 0 0 1 0 1 1 1 1 0 0 1 0 1 1 0 1 1 0 0 1 0 0 1 1 0 1 1 0 1
## [46207] 0 1 0 0 0 1 0 1 1 1 0 1 1 1 0 1 1 0 0 1 0 1 0 1 1 0 1 1 0 0 1 0 1
## [46275] 0 1 0 1 1 1 1 0 0 0 0 0 0 1 1 0 1 1 1 1 1 1 0 0 0 0 1 1 1 0 0 0 1 1 0
## [46309] 0 1 0 0 1 0 0 0 1 1 1 0 1 1 0 0 0 1 0 1 0 0 0 1 0 0 0 0 1 1 0 1 1
## [46377] 1 0 1 1 1 1 1 1 1 0 1 0 1 1 0 0 1 0 0 1 1 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0
## [46445] 1 0 0 1 0 1 1 0 0 0 1 0 1 1 1 0 1 1 1 1 1 1 1 0 0 1 0 0 1 1 0 1 1 0 1
## [46479] 0 1 1 0 0 0 1 1 1 0 1 0 0 0 1 1 1 0 0 0 0 1 0 1 1 1 1 0 1 0 0 0 1 0
## [46513] 1 0 0 1 0 1 1 1 1 0 1 0 0 1 1 1 1 0 1 0 0 1 0 1 1 1 0 0 1 0 1 1 1 1 1 1 1 0
## [46581] 1 1 0 0 0 1 1 0 0 0 0 1 1 1 0 0 0 0 1 0 0 0 0 0 0 1 0 1 0 1 0 0 1 1 0 0
## [46615] 1 1 0 0 0 1 1 1 1 1 0 0 0 1 1 0 0 1 0 0 1 1 0 1 0 1 1 0 0 1 0 1 0 1 0 1
## [46683] 0 1 0 1 1 0 0 1 1 0 1 0 1 1 0 1 1 1 0 0 0 0 1 1 1 0 0 1 1 1 0 0 0 1 1
## [46717] 1 0 0 0 1 1 1 1 1 0 1 0 1 1 1 1 0 0 1 0 1 1 1 0 0 1 1 1 1 0 0 0 1 0
## [46751] 1 0 1 0 0 0 1 0 0 1 0 1 0 0 0 1 0 0 0 1 1 0 1 1 1 0 1 1 0 0 0 0
## [46921] 1 1 1 1 0 0 1 0 0 0 1 1 1 1 1 0 0 1 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 0
## [46989] 1 1 1 0 0 1 1 1 1 1 0 0 0 1 1 1 1 1 0 0 0 1 0 1 1 1 1 1 0 0 0
## [47023] 0 1 0 1 0 0 0 1 0 1 0 1 0 0 0 0 0 1 1 0 1 1 0 0 0 1 0 0 0 0 1 0 1
## [47057] 0 1 0 1 1 1 1 0 1 1 0 0 0 1 0 0 1 1 0 1 0 0 0 1 1 1 0 1 0 1 0 0 0 0
## [47091] 0 0 0 0 0 0 0 0 1 0 1 1 0 1 1 0 1 0 0 1 0 1 1 1 0 1 0 0 1 0 1 0 1 0 0
## [47125] 0 0 0 0 0 1 1 0 1 0 0 0 0 0 1 0 1 1 1 0 0 1 1 0 1 0 1 0 1 1 0 0 0 1
## [47159] 1 0 1 1 0 0 1 1 1 0 1 1 0 0 0 0 0 1 0 0 1 0 0 0 0 1 1 0 1 0 1 0 0
## [47227] 1 1 0 0 1 0 1 1 0 1 0 1 1 1 0 1 1 1 0 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1
## [47261] 0 0 1 1 1 0 1 0 1 0 1 0 0 0 1 1 1 0 0 1 1 1 0 0 1 1 1 0 1 0 1 1 1 0 1
## [47329] 0 1 1 1 1 1 0 0 1 0 1 0 0 1 1 0 1 1 1 0 1 0 1 0 0 1 0 0 0 0 1 1 1 0
## [47363] 1 0 1 0 1 1 0 0 1 0 0 1 0 0 1 0 1 1 1 0 0 0 1 0 1 1 1 1 1 1 1 1 0 0
## [47397] 0 0 1 1 0 0 0 0 1 1 1 0 1 0 1 1 0 0 0 1 0 1 0 1 1 1 1 1 1 1 0 1 0 1 1
## [47499] 0 0 0 1 0 0 1 1 1 0 1 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 0 0 1
## [47533] 0 0 0 1 1 0 0 0 0 0 0 1 0 0 0 0 1 1 0 1 0 0 0 0 0 1 1 0 0 0 0 1 1 0 0 1 1 1 0
## [47567] 0 0 1 0 0 1 0 0 0 0 1 1 0 0 0 1 1 1 0 0 0 0 1 1 1 0 1 1 0 1 1 1 1 1
## [47601] 0 1 1 0 1 0 1 0 0 1 0 0 1 1 0 1 0 0 0 0 0 1 0 1 0 1 0 0 0 1 1 0 1
## [47737] 1 0 0 0 1 1 0 1 1 1 0 0 0 1 0 1 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1
## [47771] 0 1 0 1 1 1 0 0 0 1 1 1 0 0 0 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 1 1 1
```

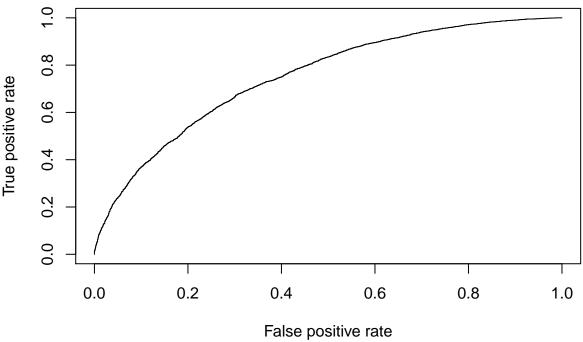
```
## [47941] 1 0 0 1 1 0 1 0 0 0 0 1 1 0 0 1 1 0 0 1 0 1 0 0 1 1 0 0 0 0 1 1 0
## [48009] 0 1 1 0 0 1 1 0 0 1 1 1 0 0 1 0 1 1 1 0 0 0 1 1 0 1 1 0 0 0 1 0 1
## [48111] 1 0 0 1 1 1 1 1 0 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 0 0 1 0 1 0 0 1 0 1
## [48145] 1 0 0 1 0 0 1 0 1 0 1 0 1 1 1 1 1 0 0 0 0 1 1 0 1 1 0 1 1 0 1 1 1 0
## [48213] 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1 0 1 1 1 0 1 1 1 1 0 1 0 1 1 1 1 1 1 1 1 1 0 0
## [48247] 0 1 1 1 1 0 1 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 1 1 1 0 0 1 1 0 0 1
## [48281] 1 1 1 1 0 1 0 0 1 0 0 1 1 0 1 0 0 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1
## [48315] 0 0 1 0 0 1 1 0 0 1 0 0 0 1 0 0 0 1 1 1 1 1 0 0 1 0 1 1 1 0 0 1
## [48349] 0 0 0 0 1 1 1 1 1 0 0 1 1 0 1 1 0 0 0 1 1 1 0 1 1 0 1 1 0 0 0 1 1 0 0
## [48383] 1 1 1 1 1 1 0 0 1 1 0 1 1 0 0 1 0 1 1 1 0 0 1 1 0 1 0 0 1 0 1 1 0 1
## [48417] 0 1 1 0 0 0 1 0 0 0 0 1 0 1 0 1 0 0 0 1 1 0 1 0 0 0 0 1 1 1 0 0 0 0 1 1 1 0 0 0 0 1 1
## [48451] 1 1 0 1 1 0 0 1 0 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 0 1 1 0 0
## [48485] 0 0 1 0 1 0 1 1 1 0 1 1 1 0 1 1 1 0 0 1 0 1 0 0 0 0 1 0 0 0 0 1 1
## [48553] 0 0 1 0 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 0 1 0 0 1 1 0 1 1 0 0 1 1 0 0 0
## [48587] 1 1 1 1 0
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
##
    0
        1
## 4817 5183
## pre-test lr : #training: 6000 #testing 4000
## error rate: 0.3075
## 10 -fold CV run 1 lr : #training: 9000 #testing 1000
##
      error= 0.309
## 10 -fold CV run 2 lr : #training: 9000 #testing 1000
      error= 0.317
## 10 -fold CV run 3 lr : #training: 9000 #testing 1000
##
      error= 0.302
## 10 -fold CV run 4 lr : #training: 9000 #testing 1000
##
      error= 0.303
## 10 -fold CV run 5 lr : #training: 9000 #testing 1000
      error= 0.3
## 10 -fold CV run 6 lr : #training: 9000 #testing 1000
      error= 0.32
## 10 -fold CV run 7 lr : #training: 9000 #testing 1000
##
      error= 0.31
## 10 -fold CV run 8 lr : #training: 9000 #testing 1000
      error= 0.318
## 10 -fold CV run 9 lr : #training: 9000 #testing 1000
      error= 0.328
## 10 -fold CV run 10 lr : #training: 9000 #testing 1000
      error= 0.305
## 10 -fold CV results: avg error= 0.3112
```



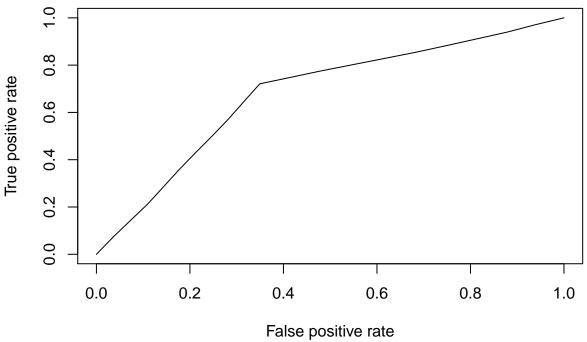
```
## error= 0.3691905 precision= 0.7182231 recall= 0.6261909 f-score 0.5945172
## auc= 0.7619961
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
     0
##
           1
## 4817 5183
## pre-test knn : #training: 6000 #testing 4000
## error rate: 0.5235
## 10 -fold CV run 1 knn : #training: 9000 #testing 1000
##
        error= 0.506
## 10 -fold CV run 2 knn : #training: 9000 #testing 1000
        error= 0.513
## 10 -fold CV run 3 knn : #training: 9000 #testing 1000
        error= 0.541
## 10 -fold CV run 4 knn : #training: 9000 #testing 1000
##
        error= 0.522
## 10 -fold CV run 5 knn : #training: 9000 #testing 1000
        error= 0.514
## 10 -fold CV run 6 knn : #training: 9000 #testing 1000
##
        error= 0.526
## 10 -fold CV run 7 knn : #training: 9000 #testing 1000
##
        error= 0.549
## 10 -fold CV run 8 knn : #training: 9000 #testing 1000
##
        error= 0.491
## 10 -fold CV run 9 knn : #training: 9000 #testing 1000
        error= 0.532
##
## 10 -fold CV run 10 knn : #training: 9000 #testing 1000
        error= 0.492
## 10 -fold CV results: avg error= 0.5186
```



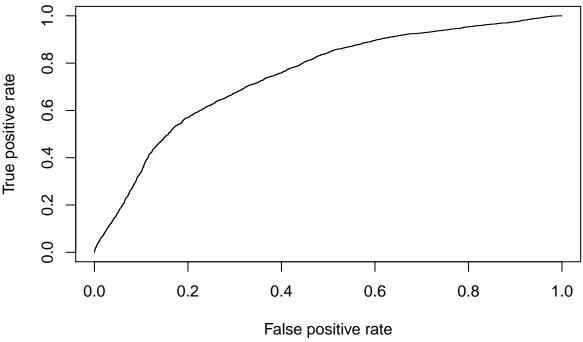
```
## error= 0.5002 precision= 0.4406923 recall= 0.4998071 f-score 0.4552565
## auc= 0.4991995
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
      0
##
           1
## 4817 5183
## pre-test nb : #training: 6000 #testing 4000
## error rate: 0.312
## 10 -fold CV run 1 nb : #training: 9000 #testing 1000
##
        error= 0.304
## 10 -fold CV run 2 nb : #training: 9000 #testing 1000
        error= 0.341
## 10 -fold CV run 3 nb : #training: 9000 #testing 1000
        error= 0.314
## 10 -fold CV run 4 nb : #training: 9000 #testing 1000
##
        error= 0.322
## 10 -fold CV run 5 nb : #training: 9000 #testing 1000
        error= 0.302
## 10 -fold CV run 6 nb : #training: 9000 #testing 1000
##
        error= 0.308
## 10 -fold CV run 7 nb : #training: 9000 #testing 1000
##
        error= 0.358
## 10 -fold CV run 8 nb : #training: 9000 #testing 1000
##
        error= 0.307
## 10 -fold CV run 9 nb : #training: 9000 #testing 1000
        error= 0.296
##
## 10 -fold CV run 10 nb : #training: 9000 #testing 1000
        error= 0.306
## 10 -fold CV results: avg error= 0.3158
```



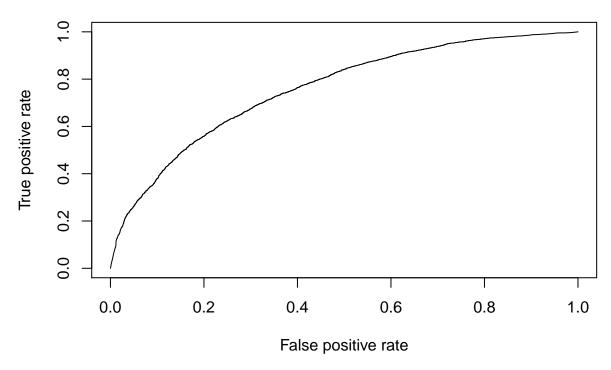
```
## error= 0.3747852 precision= 0.7067642 recall= 0.6207937 f-score 0.5879847
## auc= 0.7507905
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
     0
##
           1
## 4817 5183
## pre-test dtree : #training: 6000 #testing 4000
## error rate: 0.32275
## 10 -fold CV run 1 dtree : #training: 9000 #testing 1000
##
        error= 0.333
## 10 -fold CV run 2 dtree : #training: 9000 #testing 1000
        error= 0.295
## 10 -fold CV run 3 dtree : #training: 9000 #testing 1000
        error= 0.311
## 10 -fold CV run 4 dtree : #training: 9000 #testing 1000
##
        error= 0.32
## 10 -fold CV run 5 dtree : #training: 9000 #testing 1000
        error= 0.304
## 10 -fold CV run 6 dtree : #training: 9000 #testing 1000
##
        error= 0.327
## 10 -fold CV run 7 dtree : #training: 9000 #testing 1000
##
        error= 0.313
## 10 -fold CV run 8 dtree : #training: 9000 #testing 1000
##
        error= 0.306
## 10 -fold CV run 9 dtree : #training: 9000 #testing 1000
        error= 0.315
##
## 10 -fold CV run 10 dtree : #training: 9000 #testing 1000
        error= 0.305
## 10 -fold CV results: avg error= 0.3129
```



```
## error= 0.4140714 precision= 0.6298314 recall= 0.6029602 f-score 0.577765
## auc= 0.6797521
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
     0
##
           1
## 4817 5183
## pre-test svm : #training: 6000 #testing 4000
## error rate: 0.30875
## 10 -fold CV run 1 svm : #training: 9000 #testing 1000
##
        error= 0.297
## 10 -fold CV run 2 svm : #training: 9000 #testing 1000
        error= 0.302
## 10 -fold CV run 3 svm : #training: 9000 #testing 1000
        error= 0.331
## 10 -fold CV run 4 svm : #training: 9000 #testing 1000
##
        error= 0.34
## 10 -fold CV run 5 svm : #training: 9000 #testing 1000
        error= 0.291
## 10 -fold CV run 6 svm : #training: 9000 #testing 1000
##
        error= 0.306
## 10 -fold CV run 7 svm : #training: 9000 #testing 1000
##
        error= 0.316
## 10 -fold CV run 8 svm : #training: 9000 #testing 1000
##
        error= 0.302
## 10 -fold CV run 9 svm : #training: 9000 #testing 1000
        error= 0.327
##
## 10 -fold CV run 10 svm : #training: 9000 #testing 1000
        error= 0.332
## 10 -fold CV results: avg error= 0.3144
```



```
## error= 0.3762134 precision= 0.6955626 recall= 0.619416 f-score 0.5858854
## auc= 0.7479301
## my dataset: 10000 observations 6 predictors
## label (y) distribution:
##
     0
           1
## 4817 5183
## pre-test ada : #training: 6000 #testing 4000
## error rate: 0.3185
## 10 -fold CV run 1 ada : #training: 9000 #testing 1000
##
        error= 0.292
## 10 -fold CV run 2 ada : #training: 9000 #testing 1000
        error= 0.294
## 10 -fold CV run 3 ada : #training: 9000 #testing 1000
        error= 0.314
## 10 -fold CV run 4 ada : #training: 9000 #testing 1000
##
        error= 0.323
## 10 -fold CV run 5 ada : #training: 9000 #testing 1000
        error= 0.327
## 10 -fold CV run 6 ada : #training: 9000 #testing 1000
##
        error= 0.32
## 10 -fold CV run 7 ada : #training: 9000 #testing 1000
##
        error= 0.327
## 10 -fold CV run 8 ada : #training: 9000 #testing 1000
##
        error= 0.324
## 10 -fold CV run 9 ada : #training: 9000 #testing 1000
        error= 0.295
##
## 10 -fold CV run 10 ada : #training: 9000 #testing 1000
        error= 0.304
## 10 -fold CV results: avg error= 0.312
```



error= 0.3510117 precision= 0.7097402 recall= 0.6484099 f-score 0.6313298 ## auc= 0.7585517