

Forecast Monthly gambling expenditure

```
directory_req <- 'C:\\R_working\\'
knitr::opts_knit$set(root.dir = directory_req)

filename <- 'monthly_gambling.txt'

input_data <- read.table(file = filename, sep = " ", skip = 1, col.names = c('G_Exp'))
print(input_data)
```

```
##      G_Exp
## 1    5.81
## 2    5.76
## 3    5.99
## 4    6.12
## 5    6.03
## 6    6.25
## 7    5.80
## 8    5.67
## 9    5.89
## 10   5.91
## 11   5.86
## 12   6.07
## 13   6.27
## 14   6.68
## 15   6.77
## 16   6.71
## 17   6.62
## 18   6.50
## 19   5.89
## 20   6.05
## 21   6.43
## 22   6.47
## 23   6.62
## 24   6.77
## 25   6.70
## 26   6.95
## 27   6.73
## 28   7.07
## 29   7.28
## 30   7.32
## 31   6.76
## 32   6.93
## 33   6.99
## 34   7.16
## 35   7.28
## 36   7.08
## 37   7.34
## 38   7.87
## 39   6.28
## 40   6.30
## 41   6.36
```

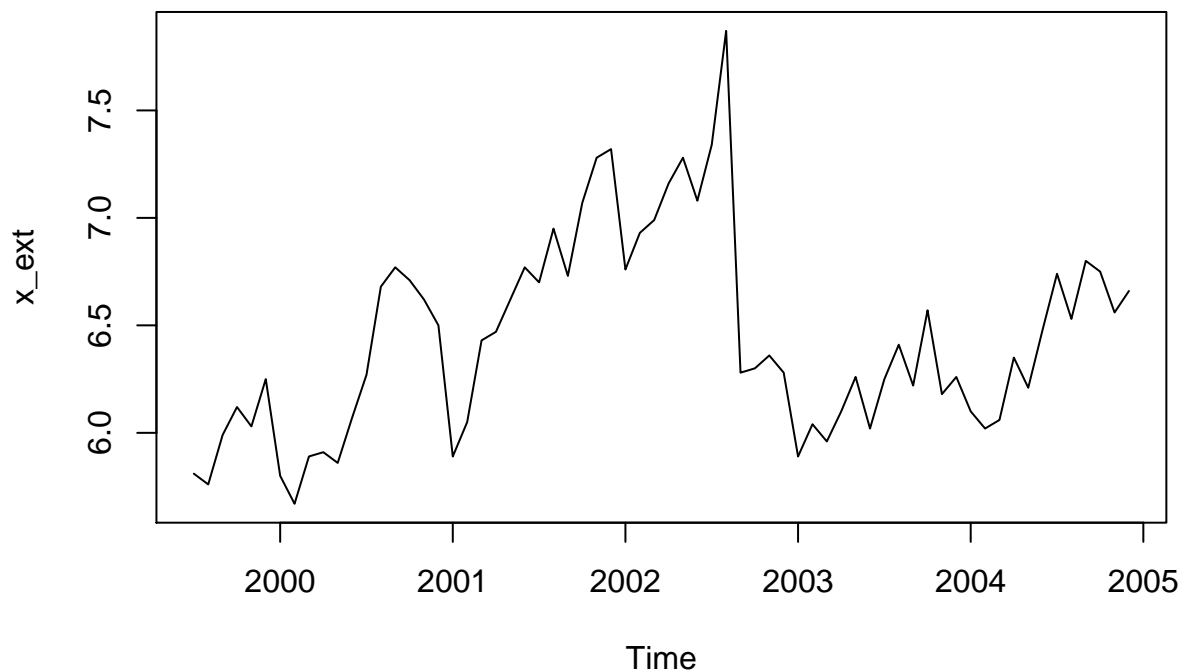
```
## 42 6.28
## 43 5.89
## 44 6.04
## 45 5.96
## 46 6.10
## 47 6.26
## 48 6.02
## 49 6.25
## 50 6.41
## 51 6.22
## 52 6.57
## 53 6.18
## 54 6.26
## 55 6.10
## 56 6.02
## 57 6.06
## 58 6.35
## 59 6.21
## 60 6.48
## 61 6.74
## 62 6.53
## 63 6.80
## 64 6.75
## 65 6.56
## 66 6.66
## 67 6.18
## 68 6.40
## 69 6.43
## 70 6.54
## 71 6.44
## 72 6.64
## 73 6.82
## 74 6.97
## 75 7.00
## 76 6.91
## 77 6.74
## 78 6.98
## 79 6.37
## 80 6.56
## 81 6.63
## 82 6.87
## 83 6.68
## 84 6.75
## 85 6.84
## 86 7.15
## 87 7.09
## 88 6.97
## 89 7.15
```

```
ts_data <- ts (input_data, frequency = 12, start = c(1999,7))
print(ts_data)
```

```
##      Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
## 1999                      5.81 5.76 5.99 6.12 6.03 6.25
## 2000 5.80 5.67 5.89 5.91 5.86 6.07 6.27 6.68 6.77 6.71 6.62 6.50
```

```
## 2001 5.89 6.05 6.43 6.47 6.62 6.77 6.70 6.95 6.73 7.07 7.28 7.32
## 2002 6.76 6.93 6.99 7.16 7.28 7.08 7.34 7.87 6.28 6.30 6.36 6.28
## 2003 5.89 6.04 5.96 6.10 6.26 6.02 6.25 6.41 6.22 6.57 6.18 6.26
## 2004 6.10 6.02 6.06 6.35 6.21 6.48 6.74 6.53 6.80 6.75 6.56 6.66
## 2005 6.18 6.40 6.43 6.54 6.44 6.64 6.82 6.97 7.00 6.91 6.74 6.98
## 2006 6.37 6.56 6.63 6.87 6.68 6.75 6.84 7.15 7.09 6.97 7.15

x_ext <- ts(input_data, frequency = 12, start = c(1999,7), end = c(2004, 12))
plot(x_ext)
```



```
library(forecast)

## Loading required package: zoo
##
## Attaching package: 'zoo'
## The following objects are masked from 'package:base':
##
##   as.Date, as.Date.numeric
## Loading required package: timeDate
## This is forecast 7.3
forecastPeriodLen = 12
lowest_ME <- 0.0
lowest_alpha = 0

for ( i in seq(0.0001,0.1,length.out = 100)){
```

```

model <- hw(x_ext, initial = 'optimal', h=(forecastPeriodLen), gamma=NULL,alpha = i)
acc_model <- accuracy(model)

if(lowest_ME > acc_model[, "ME"] ){
  lowest_ME = acc_model[, "ME"]
  lowest_alpha =i
}

}

print(lowest_alpha)

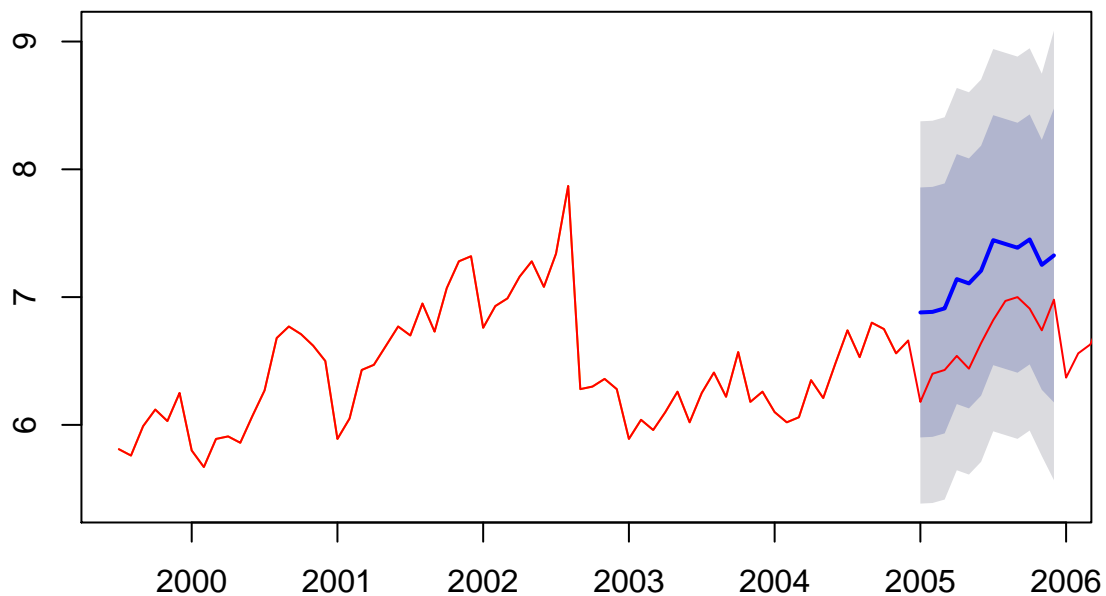
## [1] 1e-04
print(lowest_ME)

## [1] -0.4422734
model <- hw(x_ext, initial = 'optimal', h=(forecastPeriodLen), gamma=NULL,alpha = lowest_alpha)

#plot(model)
plot(model,type="l",col="orange")
lines(ts_data,col="red")

```

Forecasts from Holt–Winters' additive method



```

#accuracy(model) # calculate accuracy measures

```