

Kernel_CV

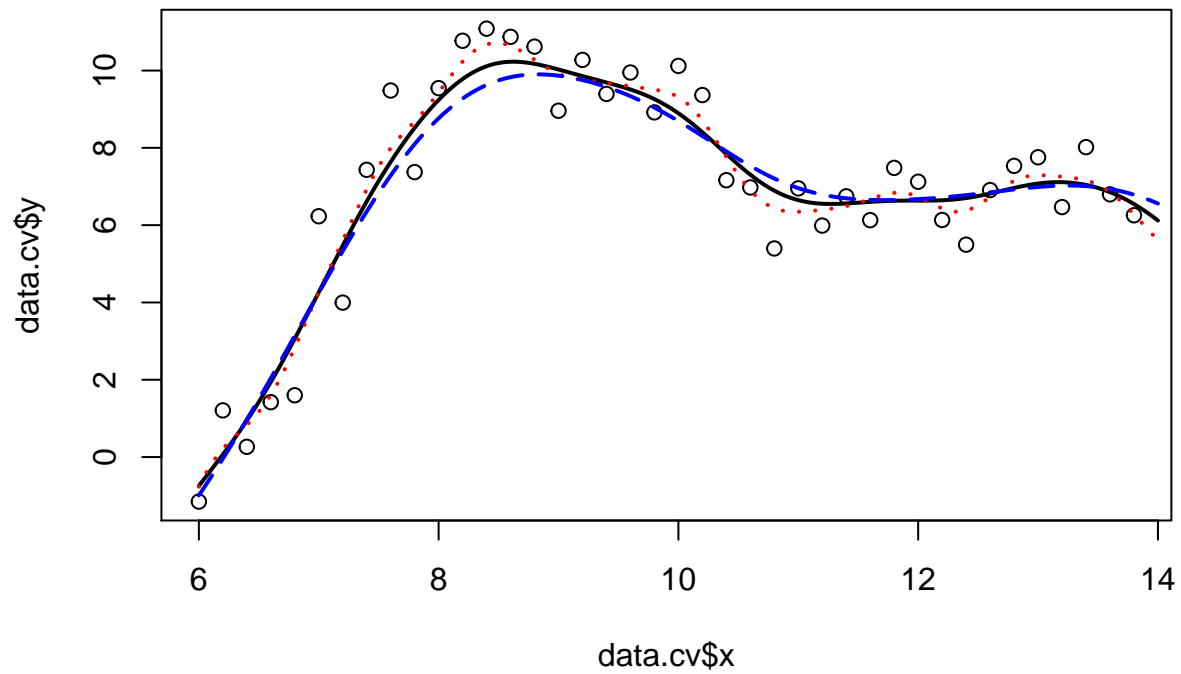
```
setwd("/Users/qiongxiasong/Dropbox/myteaching/stat6338/Spring2016/data")
Mydata<-read.table("loess.txt",header=TRUE)
library(KernSmooth)
```

```
## KernSmooth 2.23 loaded
## Copyright M. P. Wand 1997-2009
```

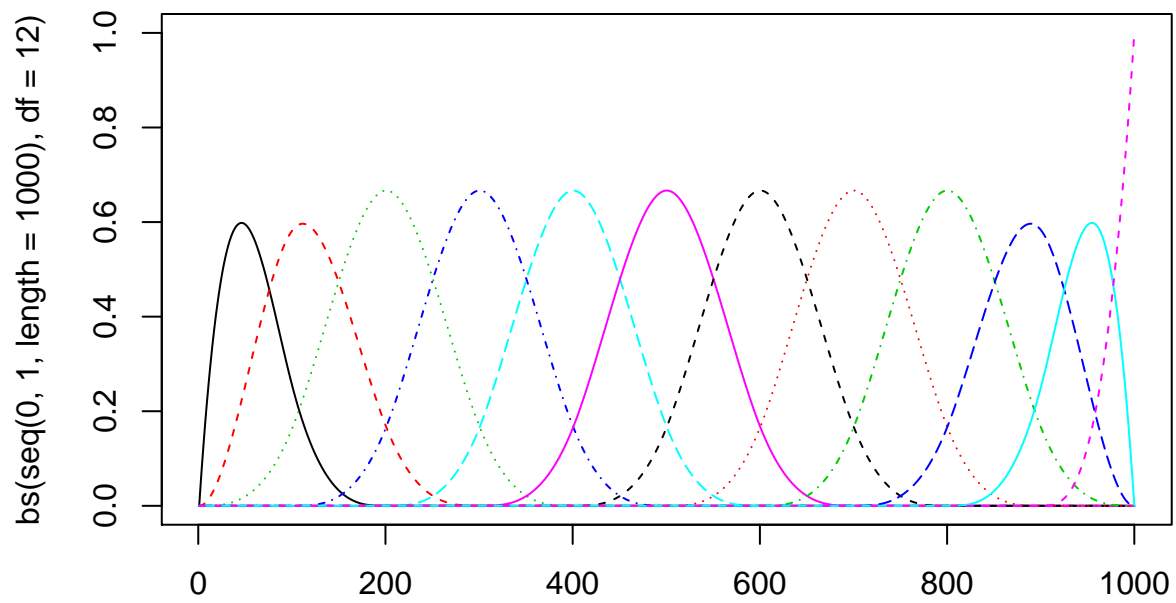
```
response<-Mydata[,2]
n=length(response)
prediction<-rep(1,n)
for (h in seq(.3,1.1,by=.05)){
  for(i in 1:n){
    data.cv<-Mydata[-i,]
    fit<-locpoly(data.cv$x,data.cv$y,range.x=c(6,14),degree=1,bandwidth=h)
    fitfn <- approxfun(fit$x, fit$y)
    prediction[i] <- fitfn(Mydata$x[i])
  }
  cv<-mean((response-prediction)^2)
  print(c(h,cv))
}
```

```
## [1] 0.300000 1.269801
## [1] 0.350000 1.216251
## [1] 0.400000 1.190703
## [1] 0.450000 1.187636
## [1] 0.500000 1.20204
## [1] 0.550000 1.230029
## [1] 0.600000 1.268808
## [1] 0.650000 1.31644
## [1] 0.700000 1.371707
## [1] 0.750000 1.433865
## [1] 0.800000 1.502413
## [1] 0.850000 1.576903
## [1] 0.900000 1.656883
## [1] 0.950000 1.741909
## [1] 1.000000 1.831513
## [1] 1.050000 1.925137
## [1] 1.100000 2.022246
```

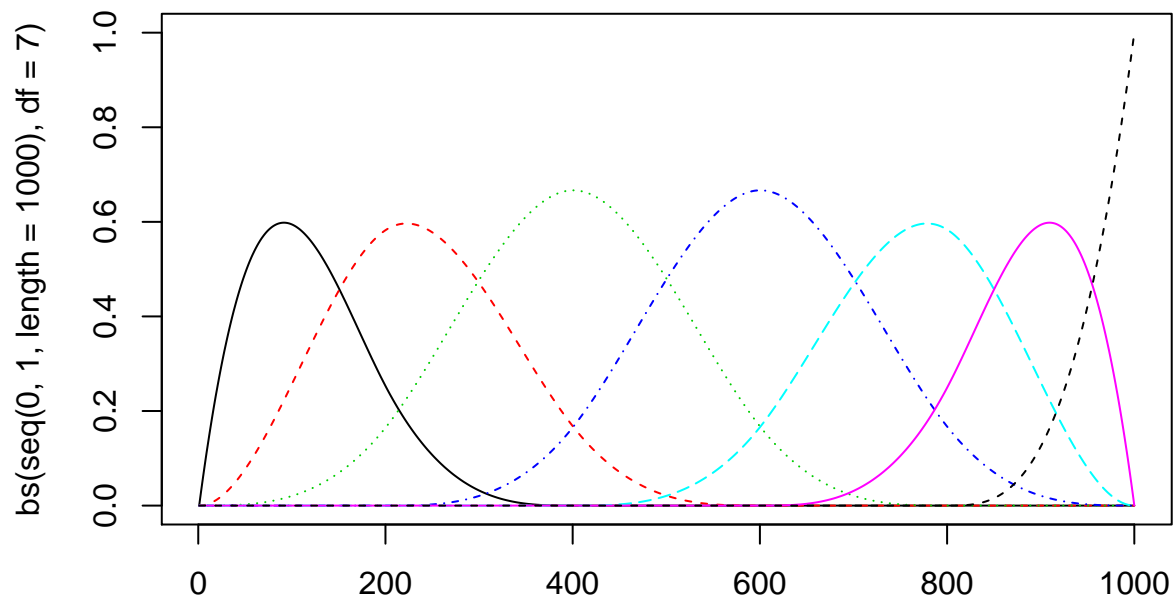
```
fit_cv<-locpoly(data.cv$x,data.cv$y,range.x=c(6,14),degree=1,bandwidth=.45)
fit_under<-locpoly(data.cv$x,data.cv$y,range.x=c(6,14),degree=1,bandwidth=.25)
fit_over<-locpoly(data.cv$x,data.cv$y,range.x=c(6,14),degree=1,bandwidth=.65)
plot(data.cv$x,data.cv$y)
lines(fit_cv, lwd=2)
lines(fit_under, lwd=2,lty=3,col="red")
lines(fit_over, lwd=2,lty=5,col="blue")
```



```
library("splines")
matplot(bs(seq(0,1,length=1000),df=12),type="l")
```



```
matplot(bs(seq(0,1,length=1000),df=7),type="l")
```



```
sml<-lm(Mydata$y~bs(Mydata$x,df=7))
plot(y~x, Mydata)
lines(predict(sml)~x,Mydata,lwd=2)
sml_1<-lm(Mydata$y~bs(Mydata$x,df=12))
lines(predict(sml_1)~x,Mydata,lty=3, col="red",lwd=2)
```

