STAT3032 SURVIVAL MODELS

TUTORIAL WEEK ELEVEN

Question One

x	y		Normal Kernal b =1				Triange Kernal b =2		
		t	k(t)	w	wy	t	k(t)	w	wy
0	4	2	0.02155	0.02062	0.082479	1	0	0	0
2.1	6	0.1	0.158441	0.1516	0.909601	0.05	1.8	0.236842	1.421053
0.5	2	1.5	0.051696	0.049464	0.098928	0.75	0	0	0
1	4.5	1	0.096581	0.092411	0.41585	0.5	0	0	0
4	7	2	0.02155	0.02062	0.144338	1	0	0	0
1.5	3	0.5	0.140525	0.134457	0.403372	0.25	1	0.131579	0.394737
1.9	8	0.1	0.158441	0.1516	1.212801	0.05	1.8	0.236842	1.894737
2	4	0	0.159236	0.15236	0.60944	0	2	0.263158	1.052632
2.5	6	0.5	0.140525	0.134457	0.806743	0.25	1	0.131579	0.789474
3	5	1	0.096581	0.092411	0.462055	0.5	0	0	0
				smooth	**5.145605**			smooth	**5.552632**

Question Two

```
#question 2
#run the R code to produce plots

set.seed(123)
x<-seq(0,4,by=0.05)
y<-sin(4*x)+rnorm(length(x),0,1/3)

par(mfrow=c(2,1))

plot(x,y)
#Kernel Smoothing
fit<-ksmooth(x,y,kernel="normal",bandwidth=0.25)
lines(fit$x,fit$y,col="red")
#using different values of bandwidth suggests that a value around 0.25 is OK.

plot(x,y)
#Spline Smoothing
library(splines)
fit<-lm(y~ns(x,df=12))
values<-seq(0,4,0.01)
temp<-data.frame("x"=values)
fit<-predict(fit,temp)
lines(values,fit,col="red")
#Using different values of df suggests that a value around 12 is OK.
```

Question Three (You won't be required to write R functions under exam conditions)

```r
#question 3
#run the R code to produce plots

smoother<-function(x,y,b) {


values<-seq(min(x),max(x),by=0.01)

fitted<-rep(0,length(values))

for(i in 1:length(values)) {

t<-abs(x-values[i])/b
kt<-2-4*abs(t)
kt<-ifelse(t<=0.5,kt,0)
w<-kt/sum(kt)
fitted[i]<-sum(y*w)

}

return(list(values=values,fitted=fitted))

}

#example of use
fit<-smoother(x,y,b=0.3)
plot(x,y)
lines(fit$values,fit$fitted,col="red")
```