Modeling

```
colNames <- c("id", "edu", "hblack", "mixed", "years", "div")
divorce <- read.table(file = "divorce.txt", header = F, col.names = colNames)
head(divorce)
```

```
##   id edu hblack mixed  years div
## 1  9   1      0     0 10.546   0
## 2 11   0      0     0 34.943   0
## 3 13   0      0     0  2.834   1
## 4 15   0      0     0 17.532   1
## 5 33   1      0     0  1.418   0
## 6 36   0      0     0 48.033   0
```

```
library(survival)
```

```
divorce$edu <- as.factor(divorce$edu)
divorce$hblack <- as.factor(divorce$hblack)
divorce$mixed <- as.factor(divorce$mixed)


#Individual predictor Models in increasing order of significance
edu_coxph <- coxph(Surv(years,div)~edu , data=divorce)

mixed_coxph <- coxph(Surv(years,div)~mixed , data=divorce)

hblack <- coxph(Surv(years,div)~hblack , data=divorce)

#Larger Models (In Increasing Significance order)
eh_coxph <- coxph(Surv(years,div)~edu+hblack , data=divorce)
eh_coxph
```

```
## Call:
## coxph(formula = Surv(years, div) ~ edu + hblack, data = divorce)
##
##             coef exp(coef) se(coef)     z       p
## edu1     0.2683    1.3077   0.0677  3.97 7.3e-05
## edu2    -0.0210    0.9792   0.1097 -0.19  0.8481
## hblack1  0.2460    1.2789   0.0765  3.22  0.0013
##
## Likelihood ratio test=27.3  on 3 df, p=5.17e-06
## n= 3371, number of events= 1032
```

```
em_coxph <- coxph(Surv(years,div)~edu+mixed , data=divorce)
em_coxph
```

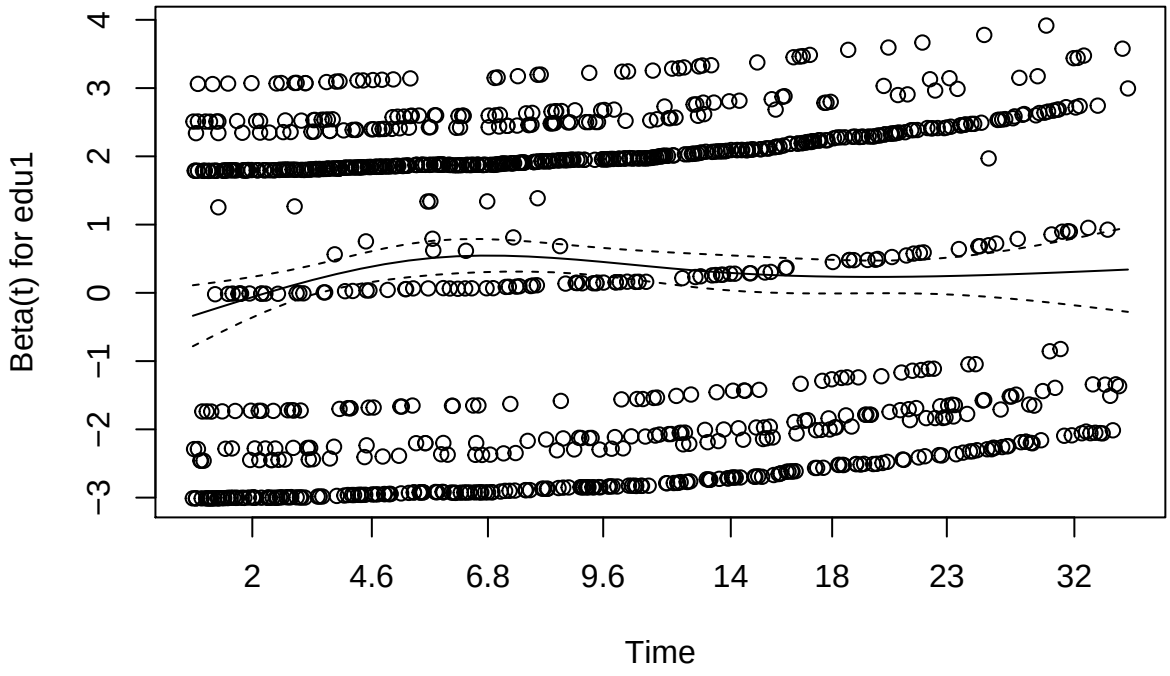
```
## Call:
## coxph(formula = Surv(years, div) ~ edu + mixed, data = divorce)
##
##             coef exp(coef) se(coef)     z       p
## edu1    0.27822   1.32077  0.06789  4.10 4.2e-05
## edu2   -0.00771   0.99232  0.10993 -0.07 0.94405
## mixed1  0.28333   1.32754  0.07603  3.73 0.00019
##
```

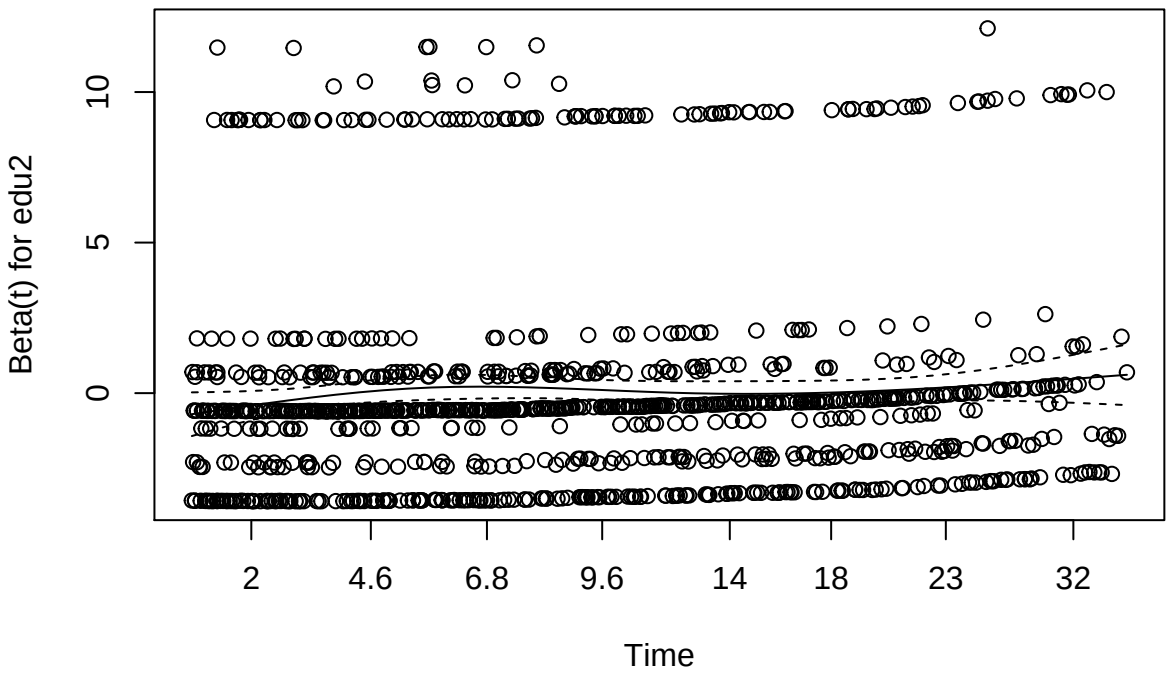
```
## Likelihood ratio test=30.6  on 3 df, p=1.03e-06
## n= 3371, number of events= 1032
```

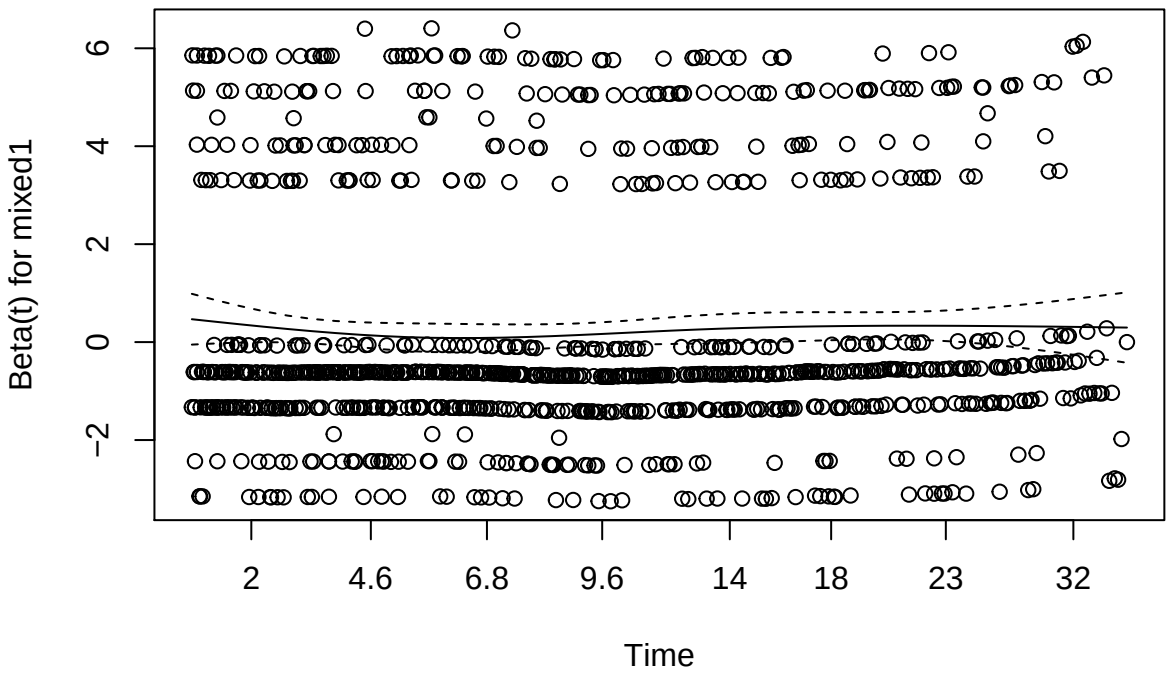
```
emb_coxph <- coxph(Surv(years,div)~edu+mixed+hblack , data=divorce)
emb_coxph
```

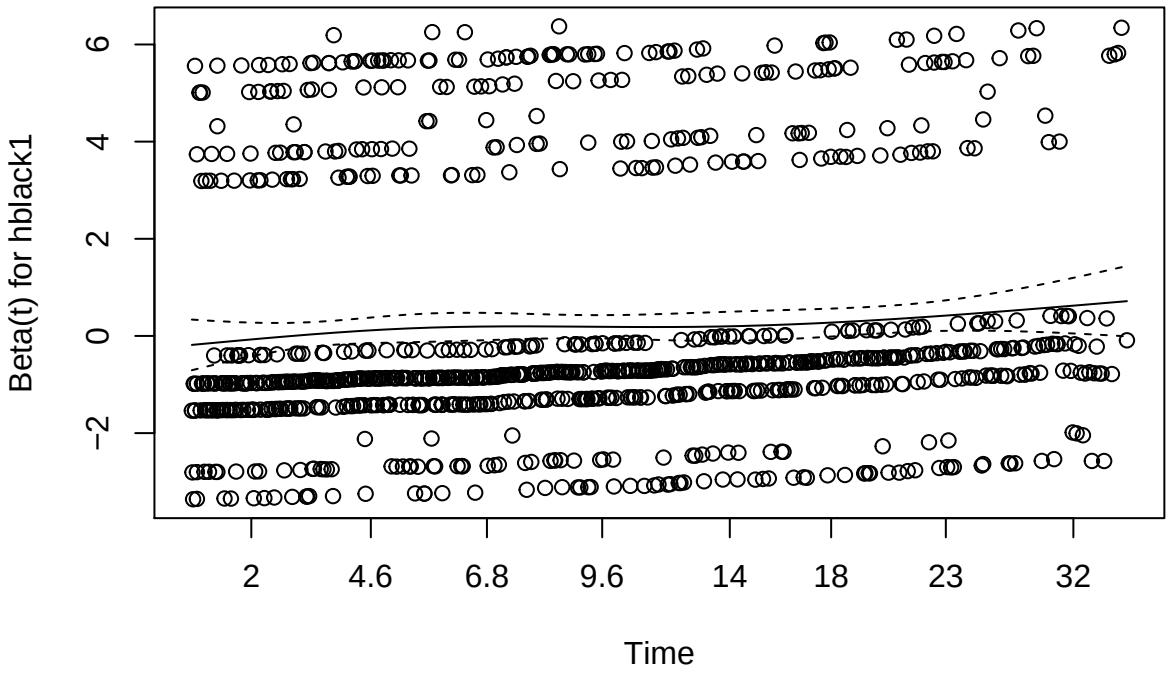
```
## Call:
## coxph(formula = Surv(years, div) ~ edu + mixed + hblack, data = divorce)
##
##            coef exp(coef) se(coef)    z       p
## edu1    0.2928    1.3401   0.0682 4.29 1.8e-05
## edu2    0.0217    1.0220   0.1107 0.20  0.8444
## mixed1  0.2342    1.2640   0.0791 2.96  0.0031
## hblack1 0.1829    1.2008   0.0796 2.30  0.0216
##
## Likelihood ratio test=35.7  on 4 df, p=3.28e-07
## n= 3371, number of events= 1032
```

```
#using cox.zph to test which predictors satisfy ph Assumption In order #make a stratified model
ph_test <- cox.zph(emb_coxph)
plot(ph_test)
```




Beta(t) for edu2
10
5
0
2
4.6
6.8
9.6
14
18
23
32
Time


Beta(t) for mixed1
6
4
2
0
−2
2
4.6
6.8
9.6
14
18
23
32
Time


Beta(t) for hblack1
6
4
2
0
−2
2
4.6
6.8
9.6
14
18
23
32
Time