

Computer Lab 11: Quasi-likelihood

Example 2, lab 3:

The following table refers to 661 children with birth weights 650 g and 1749 g all of whom survived for at least one year. The variables of interest are:

Cardiac: mild heart problems of the mother during pregnancy

Comps: gynaecological problems during pregnancy

Smoking: mother smoked at least one cigarette per day during the first months of pregnancy.

BW: was the birth weight less than 1250

Cardiac		Yes				No			
Comps		Yes		No		Yes		No	
Smoking		Yes	No	Yes	No	Yes	No	Yes	No
BW	Yes	10	25	12	15	18	12	42	45
	No	7	5	22	19	10	12	202	205

Analyze the data and interpret the relationship of the children weights and mother's habits and health conditions.

[Splus code]

```
options(contrasts=c("contr.treatment","contr.poly"))
```

```
BW.yes=c(10,25,12,15,18,12,42,45)
```

```
BW.no=c(7,5,22,19,10,12,202,205)
```

```
BW=cbind(BW.yes,BW.no)
```

```
cardiac=factor(rep(c("0","1"),each=4))
```

```
comps=factor(rep(rep(c("0","1"),each=2),2))
```

```
smoking=factor(rep(c("0","1"),4))
```

```
survived.glm=glm(BW~cardiac+comps+smoking,family=binomial(link=logit))
```

```
anova(survived.glm,test="Chisq")
```

```
summary(survived.glm)
```

```
survived.q.glm=glm(BW~cardiac+comps+smoking,family=quasi(link=logit,variance=
"mu(1-mu)"))
```

```
anova(survived.q.glm,test="Chisq")
```

```
summary(survived.q.glm,corr=F)
```

Example:

The following table from Buckley (1988), gives the frequency of all reported game-related concussions for players on 49 college football teams, between 1975 and 1982.

		Activity	
Team	Situation	Tackle	Block
Offense	Rushing	125	129
	Passing	85	31
Defense	Rushing	216	61
	Passing	62	16

Please analyze the data by quasi-likelihood method. Please make conclusions.

[code:]

```
frequency=c(125,85,216,62,129,31,61,16)
active=rep(c("Tackle","Block"),each=4)
situation=rep(c("Rushing","Passing"),4)
team=rep(c("Offense","Defense"),each=2,2)
football.data=data.frame(frequency,active,situation,team)

football.glm=glm(frequency~active+situation+team,
                 family=quasi(link=log,variance="mu"),
                 data=football.data)
summary(football.glm)
anova(football.glm,test="Chisq")
```