Problem Set 4

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Due: April 12, 2024

Instructions

- Please show your work! You may lose points by simply writing in the answer. If the problem requires you to execute commands in R, please include the code you used to get your answers. Please also include the `.R` file that contains your code. If you are not sure if work needs to be shown for a particular problem, please ask.

- Your homework should be submitted electronically on GitHub in `.pdf` form.

- This problem set is due before 23:59 on Friday April 12, 2024. No late assignments will be accepted.

Question 1

We're interested in modeling the historical causes of child mortality. We have data from 26855 children born in Skellefteå, Sweden from 1850 to 1884. Using the "child" dataset in the `eha` library, fit a Cox Proportional Hazard model using mother's age and infant's gender as covariates. Present and interpret the output.

```
1  lapply(c("eha", "survival", "stargazer"),  pkgTest)
2
3
4
5
6  data(child)
7
8  child_surv <- with(child, Surv(enter, exit, event))
9  summary(child_surv)
10
11 cox <- coxph(child_surv ~ sex + m.age, data = child)
12 summary(cox)
13 drop1(cox, test = "Chisq")
14 stargazer(cox, type = "latex")
```

] The above code loads and then fits the data into a Cox Proportional Hazard model using the 'Mother's age' and 'Infant's gender' as covariate. Then below you will see the table generated by stargazer. Interpreting the data we see that There is a 0.082 decrease in the expected log of the hazard for female babies compared to male, holding mothers age constant. There is a 0.008 increase in the expected log of the hazard for a one unit increase of mothers age when we hold infants sex constant.

Table 1:

	Dependent variable:
	child_surv
sexfemale	-0.082^{***}
	(0.027)
m.age	0.008^{***}
	(0.002)
Observations	26,574
R^2	0.001
Max. Possible R^2	0.986
Log Likelihood	$-56{,}503.480$
Wald Test	22.520^{***} (df = 2)
LR Test	22.518^{***} (df = 2)
Score (Logrank) Test	22.530^{***} (df = 2)
Note:	*p<0.1; **p<0.05; ***p<0.01