

**HW #2 due date: 03/14/2018 at 7:20pm (no class due to Spring break). Upload your C program with detailed comments and other supporting documents to the dropbox folder. Late HWS will not be accepted.**

1. Write a C program to
  - (a) read the data in HW2\_2018.dat. Note that there are 200 observations. Columns 1-4 correspond to the failure/censoring time  $Y \equiv \min\{T, C\}$ , the censoring indicator  $\Delta = I(T \leq C)$ , covariate  $X_1$ , and covariate  $X_2$ , respectively. Here  $T$  is the failure time and  $C$  is the censoring time;
  - (b) Write a C function to calculate the partial likelihood. Calculate the log-partial likelihood with parameter values  $(\beta_1, \beta_2) = (0.5, -0.5)$ .
2. Write a C program to
  - (a) generate  $n = (50, 100, 200)$  i.i.d. normal random numbers with mean  $\mu = -0.5$  and variance  $\sigma^2 = 2$ .
  - (b) obtain the point estimates, their standard error estimates and 95% confidence interval estimates of  $\mu$  and  $\sigma^2$ .
  - (c) repeat (1) and (2) 1000 times; calculate the sample average and sample standard deviation of the estimates, sample average of the standard error estimates, and the empirical coverage probability of the 95% confidence interval estimator for each unknown parameter.

Write a report on the details of the simulation study and report the results in a table.