Pontificia Universidad Católica de Chile
Instituto de Ingeniería Biológica y Médica
IBM3104 - Statistical Methods for BME

Homework 1: Survival Analysis

Due date: Wednesday 21st October 2020

"SURVIVAL65.TXT" is data from a study on multiple myeloma in which researchers treated 65 patients with alkylating agents. Of those patients, 48 died during the study and 17 survived. The goal of this study is to identify important prognostic factors.

- TIME: survival time in months from diagnosis
- STATUS: 1 = dead, 0 = alive (censored)
- LOGBUN: log blood urea nitrogen (BUN) at diagnosis
- HGB: hemoglobin at diagnosis
- PLATELET: platelets at diagnosis: 0 = abnormal, 1 = normal
- AGE: age at diagnosis in years
- LOGWBC: log WBC at diagnosis
- FRACTURE: fractures at diagnosis: 0 = none, 1 = present
- LOGPBM: log percentage of plasma cells in bone marrow
- PROTEIN: proteinuria at diagnosis
- SALCIUM: serum calcium at diagnosis

1. Use the Kaplan Meier method to estimate the distribution of survival time for the total sample.
   a) Plot the Kaplan Meier curve for the total sample. (2 points)
   b) What is the mean survival time and standard error? (1 point)
   c) What is the median survival time and 95 % CI? (1 point)
   d) How many censored observations are there? (1 point)
2. Using Kaplan Meier method to estimate whether fracture influences survival time.
   a) Plot one Kaplan Meier curve for the patients with fracture and another one for the patients without fracture (2 points)
   b) What is the median survival time and 95 % CI in each group? (1 point)
   c) Interpret the Log Rank test and the survival curves. (2 points)