C.2 Two Sample

Which Gum Lasts Longer?

Problem:

We want to compare the flavor durations, in minutes, for two brands of chewing gum. However, some of our data values have been censored at 40 minutes. How can we analyze this data?

Background:

We have seen how to analyze data for a single right-censored sample. In order to compare two right-censored samples, we will extend what we have learned for the one sample case.

Instructions:

1. Below are two right-censored samples. These samples give flavor duration values, in minutes, for two brands of sugar-free cinnamon stick gum. Some of the data values have been censored at 40 minutes (denoted by '40c').

Brand 1 (n = 25)

40c	40	22	35	30
35	7	40c	40c	32
40c	40	20	20	27
40c	40c	7	40c	31
40c	30	13	40c	40c

Brand 2 (n = 18)

8	16	20	28
40c	22	40	25
17	26	40c	30
35	40c	35	
40c	30	28	

2. You have previously constructed the Kaplan-Meier life table for the Brand 1 flavor duration values. Use a statistical software package to construct the Kaplan-Meier life table for the Brand 2 values. Using complete sentences, compare and contrast the two tables.

3. You have previously constructed the Kaplan-Meier survival function for the Brand 1 flavor duration values. Use a statistical software package to construct and plot Kaplan-Meier survival functions for the flavor duration values of both of the gum brands. Be sure to plot both survival functions on the same graph. Using complete sentences, compare the overall survival rates for the two brands. Does it appear that one of the brands tends to have longer flavor duration values than the other brand?

4. We can use a statistical hypothesis test to compare the survival (or failure) times for two or more samples. Two of the different tests for censored data that are available are the Log Rank test and the Wilcoxon test (Breslow's generalized Wilcoxon test). Use a statistical software package to perform one of these tests in order to determine if there is a significant difference in the flavor duration values for the two brands.