

COMPARING THE DURABILITY OF TIRES

1. Problem Formulation

A tire manufacturer is experimenting with a new technology, which hopefully will produce more durable tires. He has recently developed a new type of tire (brand A) that is supposed to be more durable than its currently marketed tire (brand B). In order to compare the durability of the two brands, an experiment involving twenty automobiles was carried out. On each automobile, an A tire was randomly assigned to one of the rear wheels and a B tire was assigned to the other rear wheel. Then the automobiles were operated for 20,000 km under normal circumstances.

One possible measure of durability is tread depth. The new technology is supposed to reduce the tire wear, or equivalently increase the tread depth of tires. In order to evaluate the effectiveness of the technology, the tread depth (expressed in 1/32 of an inch) was determined and recorded for each of the forty tires. The data are available in the SPSS file *tires.sav* located on the FTP server. The instructions how to access the data on the server and download it to your floppy disk are available in *Downloading Data Files Using FTP* module.

The following is a description of the variables in the data file:

<u>Column</u>	<u>Name of Variable</u>	<u>Description of Variable</u>
1	Brand A	Tread Depth (1/32 in.)
2	Brand B	Tread Depth (1/32 in.)

We will use SPSS to answer the following two questions using the data:

1. Do the data allow us to conclude that the brand A tires are more durable, on the average, than the brand B tires?
2. Estimate the change in the durability of tires after the new technology was implemented by means of a 95% confidence interval for the mean difference in the tread depth between brand A and brand B tires.