

Chapter 886

Screening Designs

Introduction

Screening designs are used to find the important factors from a large number (up to 31) of two-level factors. When the number of runs is 4, 8, 16, or 32 (powers of 2), the design is a regular fractional replication. When the number of runs is 12, 20, 24, or 28, the design used is a Plackett-Burman design.

This program uses the screening designs given in Lawson (1987). These designs make it possible to evaluate each main effect, although these are aliased with several interactions.

An introduction to experimental design is presented in Chapter 881 on Two-Level Designs and will not be repeated here.

Example 1 – Screening Design

This section presents an example of how to generate an experimental design using this program. **CAUTION: since the purpose of this routine is to generate data, you should always begin with an empty output spreadsheet.**

In this example, we will show you how to generate a six-factor design using 16 runs.

Setup

If the procedure window is not already open, use the PASS Home window to open it. The parameters for this example are listed below and are stored in the **Example 1** settings file. To load these settings to the procedure window, click **Open Example Settings File** in the Help Center or File menu.

Design Tab

Runs	16
Sort Order	Standard
Factor 1.....	-1 1
Factor 2.....	-1 1
Factor 3.....	-1 1
Factor 4.....	-1 1
Factor 5.....	-1 1
Factor 6.....	-1 1
Store Data on Spreadsheet	Checked
First Factor Column	1

Output

Click the Calculate button to perform the calculations and generate the following output.

Six-Factor Screening Design in Sixteen Runs

Experimental Design

Row	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1	-1	-1	-1	-1	-1	-1
2	1	-1	-1	-1	1	1
3	-1	1	-1	-1	1	1
4	1	1	-1	-1	-1	-1
5	-1	-1	1	-1	1	-1
6	1	-1	1	-1	-1	1
7	-1	1	1	-1	-1	1
8	1	1	1	-1	1	-1
9	-1	-1	-1	1	-1	1
10	1	-1	-1	1	1	-1
11	-1	1	-1	1	1	-1
12	1	1	-1	1	-1	1
13	-1	-1	1	1	1	1
14	1	-1	1	1	-1	-1
15	-1	1	1	1	-1	-1
16	1	1	1	1	1	1

The values were also produced on the spreadsheet.

These values are also generated on the spreadsheet. Usually, you would specify the number of runs as close to the number of variables as possible, while still leaving some degrees of freedom for an estimate of error.