Homework Assignment

19.1 Analyze the 2^{4-1} design shown in Table 19.12.

TABLE 19.12 A 2^{4-1} Design

	C_1D_1	C_1D_2	C_2D_1	C_2D_2
A_1B_1	—	40	15	—
A_1B_2	—	20	10	—
A_2B_1	100	—	—	30
A_2B_2	120	—	—	50

a. Quantify all main effects.
b. Quantify percentages of variation explained.
c. Sort the variables in the order of decreasing importance.
d. List all confoundings.
e. Can you propose a better design with the same number of experiments.
f. What is the resolution of the design?

19.2 Is it possible to have a 2^{4-1}_{III} design? A 2^{4-1}_{II} design? A 2^{4-1}_{IV} design? If yes, give an example.

21.3 Analyze the code size data of Table 21.23. Ignore the second column corresponding to the 68000 for this exercise. Answer the following:
a. What percentage of variation is explained by the processor?
b. What percentage of variation can be attributed to the workload?
c. Is there a significant (at 90% confidence) difference between any two processors?

TABLE 21.23 Measured Data for the RISC Code Size Study

Workload	RISC-I	68000	Z8002	VAX-11/780	PDP-11/70	C/70
E-String Search	140	112	126	98	112	98
F-Bit Test	120	144	180	144	168	120
H-Linked List	176	123	141	211	299	141
K-Bit Matrix	288	317	374	288	374	317
I-Quick Sort	992	694	1,091	893	1,091	893
Ackermann(3,6)	144	—	302	72	86	86
Recursive Qsort	2,736	—	1,368	1,368	1,642	1,642
Puzzle (Subscript)	2,796	2,516	1,398	1,398	1,398	1,678
Puzzle (Pointer)	752	—	602	451	376	376
SED (Batch Editor)	17,720	—	17,720	10,632	8,860	8,860
Towers Hanoi (18)	96	—	240	77	96	67

Adapted with permission from Patterson and Sequin (1982).