

16.1. a) Significant Interactions \rightarrow Full Factorial Design

$$n = \prod_{i=1}^k n_i = 3 \times 3 \times 3 = \underline{\underline{27}}$$

b) Simple Design \rightarrow no interactions

68000 CPU Disk A
8086 CPU 1
80286 CPU A \rightarrow CPU

68000 DOS A
68000 CPU B

68000 UNIX A
OS

68000 CPU C
Disk

$$\Rightarrow n = 1 + \sum_{i=1}^k (n_i - 1) = 7$$

c) Fractional Factorial

Design $\Rightarrow 3^{2-1}$ Design = 9

CPU OS Disk
68 CPU A
68 DOS B
68 UX C
80 CPU
80 DOS
80 UX
286 CPU
286 DOS
286 UX

17.1. a) I	A	B	C	AB	AC	BC	ABC	Y
1	-1	-1	-1	1	1	1	-1	100
1	1	-1	-1	1	-1	1	1	120
1	-1	1	-1	-1	-1	-1	1	40
1	1	1	-1	-1	-1	-1	-1	20
1	-1	-1	1	-1	-1	-1	1	15
1	1	-1	1	-1	-1	-1	-1	10
1	-1	1	1	1	1	1	-1	30
1	1	1	1	1	1	1	1	50
385	15	-105	-175	-15	15	215	65	Total
48.13	1.88	-13.13	-21.88	-1.88	1.88	26.88	8.13	Total/8
9 _a	9 _A	9 _B	9 _C	9 _{AB}	9 _{AC}	9 _{BC}	9 _{ABC}	

$$\begin{aligned} \Rightarrow SST &= 2^3 (9_a^2 + 9_B^2 + 9_C^2 + 9_{AB}^2 + 9_{AC}^2 + 9_{BC}^2 + 9_{ABC}^2) \\ &= 8 (\dots) = 28 + 1379 + 3829 + 28 + 28 + 5780 + 528 \\ &= 11603 \end{aligned}$$

$$\Rightarrow 0.24\%, 11.88\%, 33.01\%, 0.24\%, 0.24\%, 49.82\%, 4.55\%$$

c) Sorted decreasing importance:

BC, C, B, ABC, A, AB, AC