unconventional instead of accepted terms. Without giving a lengthy list of examples, the author defines the waiting time of a customer as including the service time of that customer, contrary to accepted practice. The erlang unit is mentioned without a definition and an elementary abelian argument is labeled tauberian.

The shortcomings of this book are not merely stylistic. The proofs of several theorems are inadequate. In discussing the classical result that the output process of an $M/M/1$ queue is Poisson, the author shows only that the times between three successive departures are independent and negative exponentially distributed. This is not only insufficient, but the author's subsequent statement that the theorem is not valid for more general systems, is incorrect. P. J. Burke's theorem was indeed proved for the $M/M/s$ queue.

When there is a choice of several classical arguments the author has a propensity for selecting the least informative approach as in his presentation of the $M/G/1$ model. A number of formulas are poorly aligned and a lengthy proof ends in mid-sentence on p. 135. Apart from all other considerations, the book would have benefited from greater editorial care.

In summary, except as an accessible reference to the author's own research, this book cannot be recommended as reading material on the classical queueing models. This is unfortunate. There is a definite need for clear and unified expositions of the theory of queues, which provide a broad synthesis of an interesting but overly ramified field.

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Optimization theory, the finite dimensional case, by Magnus R. Hestenes, John Wiley and Sons, New York, London, Sydney, Toronto, 1975, xiii + 447 pp., $24.95.

The central problem of *nonlinear programming*, which is one of the four or five main areas within *mathematical programming*, can be stated as follows:

$$\text{(P)} \qquad \begin{aligned} &\text{infimize} && f_0(x) \\ &\text{subject to} && f_i(x) \leqslant 0, \quad i = 1, \ldots, r, \\ & && g_i(x) = 0, \quad i = 1, \ldots, s, \\ & && x \in S. \end{aligned}$$

In (P), the functions f_i, g_i map $S \subseteq R^n$ to R, $x = (x_1, \ldots, x_n) \in R^n$, and typically $S = R^n$ or S is a compact, or convex, or an open subset of R^n.

When $r = 0$, i.e., when all constraints in (P) are equalities, and suitable differentiability conditions are imposed, (P) becomes the calculus optimization problem that is a standard topic of most two-semester calculus sequences. Indeed, much of the work in nonlinear programming, which is not aimed at obtaining specific algorithms, is a continuation of classical investigations.

1. A concept of abstract duality. A new "twist" on (P) is provided by the fairly recent generalized dual problems, which can be abstractly formulated as follows, with $S \neq \varnothing$ an arbitrary set.