(*b*) a segment holding the value of the semaphore.

The operations it provides are *P*(semaphore), *V*(semaphore), and destroy (semaphore), which all take a semaphore descriptor as argument.

Thus *D*2 has four entry points, providing these operations and create (semaphore).

The user's domains $D_j (j > 2)$ handle semaphore descriptors and are able to ignore the structure of the semaphores. They can call *D*2 to operate on their own semaphores, but *D*1 remains available to them for more fundamental management of their own queues.

Conclusion

We have described a structure for a highly protected computer system based on widely accepted principles. With this structure, we can make available a powerful yet economical set of techniques for overcoming the problems often associated with such systems.

Acknowledgement

The authors would like to thank the referee (Mr. R. Fairbairns) for his assistance in preparing this paper for publication.

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Book reviews

Computer Simulation of Continuous Systems by R. J. Ord-Smith and J. Stephenson, 1975; 327 pages. (*Cambridge University Press*, £3·80).

It is interesting and instructive to compare the above text with (*a*) *Introduction to Computer Simulation* by A. Wayne Bennett and (*b*) *Computer Simulation of Dynamic Systems* by Ralph J. Kochenburger. Although both are somewhat larger tomes, nevertheless the same area is covered.

The first sixty pages or so, dealing with analog basics is 'the mixture as before' but this is to be expected and is not meant to be a derogatory criticism. It is just that the rest of the book is so much better in quality and presentation. Of particular interest is the digital simulation section which certainly complements the two references mentioned above. In fact the authors do more in that they get away from the conventional FORTRAN-ALGOL-CSMP languages and use BEDSOCS, an extension of BASIC. This is particularly valuable since the use of BASIC seems to be increasing in educational establishments as a first language and the interrupt-interactive aspects are bound to prove popular.

The section on hybrid computers starts well but is a little condensed —a few more pages of description here would have been welcome. However, the later chapters make up for this in clarity of exposition. One small point. This text, and indeed the other two mentioned here, purport to be for students and quite rightly set exercises to be solved; however, there are no solutions. Whilst it is recognised that unique solutions are rarely possible, it would surely help students if some indication of attack was given in an appendix.

Nevertheless, this text can be recommended with confidence for the group at which it is aimed.

B. GIRLING (London)

Computational Methods in Linear Algebra, by R. J. Goult, R. F. Hoskins, J. A. Milner and M. J. Pratt, 1974; 201 pages. (*Stanley Thornes*, £2·65)

This book aims to give a reasonably comprehensive survey of computational methods relating to the solution of sets of linear equations and the determination of eigensystems. It is intended for undergraduates and other students of numerical analysis, and for practising engineers and scientists whose work requires the use of computers for these problems.

The book contains seven chapters, four of which (those not concerned with error analysis) contain exercises for the reader. Chapter 1 gives a simple introduction to the eigenvalue problem and a brief account of the power method with deflation. Chapter 2 introduces the concept of backward error analysis and investigates the effect of rounding errors on matrix products. Chapters 3 and 4 deal with the solution of linear equations by standard direct and indirect methods respectively. Gaussian and Jordan elimination, triangular decomposition, and the methods of Jacobi, Gauss-Seidel and SOR are examined. Discretisation of Laplace's equation is used to illustrate the theory of property A matrices which are consistently or inconsistently ordered. Chapter 5 discusses the effect of perturbations on the solution of linear equations, with an error analysis of Gaussian elimination and triangulation methods. The computational aspects of the eigenvalue problem are treated in Chapter 6, with a brief account of the effect of perturbations on an eigensystem given in Chapter 7. Consideration is given to Givens' and Householder's methods, reduction to upper Hessenberg form and the QR algorithm. An Appendix gives a supplementary account of basic results on vector spaces, linear dependence, norms, etc.

The book is modestly priced and assumes only a basic knowledge of elementary matrix algebra. It gives sufficient theory for an appreciation of the main features of the methods described and, where possible, illustrates these by simple examples involving matrices of order three or four. It will be of value in its own right and as a helpful introduction to more advanced texts.

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