

Theory of Programming

Description

Basic notions of programming. The syntax and semantics of nondeterministic programs. Partial and total correctness. Weakest precondition. The notion of loop invariant. Derivation rules of program constructs. Verification: a method for proving total correctness of deterministic and nondeterministic programs. Synthesizing correct sequential programs by using the derivation rules. The correctness of concurrent programs, verification rules of the new statements (parbegin/parend, await). Owicki-Gries method for proving the total correctness of parallel programs, deadlock freedom and interference freedom.

Literature

- K. R. Apt, E.-R. Olderog. Verification of Sequential and Concurrent Program. Springer-Verlag, 1997. ISBN 978-1-84882-744-8
- S. Owicki, D. Gries. An axiomatic proof technique for parallel programs. Acta Inf., 6, pp. 319-340, 1976
- E. W. Dijkstra. A Discipline of Programming. Prentice-Hall, Englewood Cliffs, New York, 1976. ISBN-13: 978-0132158718
- D. Gries, The Science of Programming, Springer, Berlin, 1981. ISBN: 978-1-4612-5983-1