The Theory of Computation

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Solution Manual
Chapter 7, Problem 7.49

We begin by noting that *Boolean Expression Inequivalence* is in NP (guess a truth assignment that causes the two expressions to evaluate to different values) and thus that *Boolean Expression Equivalence* is in coNP. Now consider the negated version of our problem: *Boolean Expression Nonminimality*. This problem is in Σ_2^p: we guess a shorter equivalent Boolean expression and use one call to the oracle for *Boolean Expression Equivalence* to verify that the guessed expression is indeed equivalent.o Thus our given problem is in coΣ_2^p, i.e., in Π_2^p.