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Finance is one of the most rapidly changing and fastest growing areas in the corporate business world. Through these changes, modern financial instruments have become extremely complex. As a result, mathematical models are essential to implement and price these intricate financial instruments. In this particular interdisciplinary approach, we focus on a groundbreaking result in finance via mathematics called the Black-Scholes option pricing model. In this work, we implement finite difference methods to solve the Black-Scholes equation. Stability, error, and numerical examples are also explored. (Received September 12, 2013)