

# Credit Card Encryption Using RSA Algorithm

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In today's digital era, online transactions have become an integral part of our daily lives. With the increasing reliance on e-commerce, securing sensitive financial information, such as credit card details, has become paramount. This project focuses on enhancing the security of credit card information during online transactions through the application of the RSA (Rivest-Shamir-Adleman) encryption algorithm.

## Purpose of the Project

The primary goal of this project is to implement a robust encryption system that safeguards credit card information from unauthorized access and potential cyber threats. By employing the RSA algorithm, a widely recognized and mathematically secure method of encryption, the project aims to establish a reliable framework for secure online transactions.

## Real-World Problems

### 1. Data Breaches and Cyber Attacks

In recent years, the frequency and sophistication of cyber attacks have surged, resulting in numerous data breaches. Hackers target databases containing sensitive information, including credit card details, putting millions of users at risk of financial fraud.

## 2. Inadequate Encryption Techniques

Traditional encryption methods, while effective to some extent, may not provide the level of security required to counteract advanced hacking techniques. Inadequate encryption can leave vulnerabilities in systems, making them susceptible to breaches.

## Why RSA Encryption for Credit Cards?

### 1. Robust Security

RSA encryption is based on the mathematical complexity of factoring large prime numbers, making it highly secure. The difficulty of factoring large numbers forms the foundation of RSA's security, ensuring that encrypted data remains protected.

### 2. Public and Private Keys

RSA employs a dual-key system: a public key for encryption and a private key for decryption. This asymmetrical approach enhances security, as even if one key is compromised, the other remains secure.

### 3. Widely Accepted Standard

RSA is a globally recognized encryption standard used extensively for secure communication and data protection. Its widespread adoption demonstrates its reliability and trustworthiness.

### 4. Compatibility with Digital Signatures

RSA encryption is not only used for confidentiality but also for authenticating the source of a message through digital signatures. This adds an extra layer of security to online transactions.

### 5. Scalability

RSA encryption can be adapted to accommodate evolving security needs by increasing key lengths. This ensures that the encryption remains robust against advances in computational power.

By implementing RSA encryption for credit card information, this project aims to address the critical issue of securing online transactions, ultimately providing users with a safer and more reliable digital payment experience.