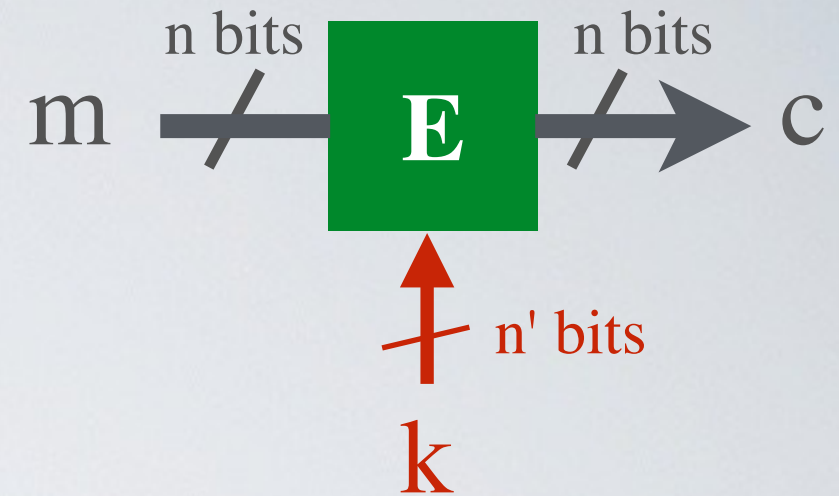


# Ideal block cipher



- Combines confusion (substitution) and diffusion (permutation)
  - Changing single bit in plaintext block or key results in changes to approximately half the ciphertext bits
- ➡ Completely obscure statistical properties of the original message
- ➡ A known-plaintext attack does not reveal the key

# DES - Data Encryption Standard

Block size	64 bits
Key Size	56 bits
Speed	~ 50 cycles per byte
Algorithm	Feistel Network

## Timeline

- **1972** NBS call for proposals
- **1974** IBM Lucifer proposal  
analyzed by DOD and enhanced by NSA
- **1976** adopted as standard
- **2004** NIST withdraws the standard