List out the different types of hashing functions.

Hash functions are used in various applications, especially in data structures like hash tables, cryptographic algorithms, etc. There are several types of hashing functions, each designed for specific purposes. Here are some common types:

1. **Division-Remainder Hash Function:**
   * Simple hash function that uses the modulo operation (%).
   * Example: **hash(key) = key % table\_size**.
2. **Multiplication Hash Function:**
   * Uses multiplication and fraction extraction methods.
   * Example: **hash(key) = floor(table\_size \* (key \* A mod 1))**.
3. **Universal Hashing:**
   * Family of hash functions designed such that the probability of collisions is minimized for any given set of keys.
   * Example: Using a randomly chosen hash function from a family of hash functions.
4. **String Hashing:**
   * Specifically designed for hashing strings.
   * Examples: Polynomial rolling hash function, DJB2, FNV-1, etc.
5. **Perfect Hashing:**
   * Designed to minimize or eliminate collisions entirely.
   * Two levels of hashing: First level (choosing buckets) and second level (assigning elements to buckets).
6. **Cryptographic Hash Functions:**
   * Specifically designed for security applications (like data integrity checks, password storage, digital signatures, etc.).
   * Examples: SHA (Secure Hash Algorithm), MD5 (Message Digest Algorithm 5), etc.
7. **Consistent Hashing:**
   * Primarily used in distributed systems to distribute load across multiple nodes efficiently, especially in scenarios like distributed caching, load balancing, etc.
   * Allows minimal redistribution of data when the number of nodes changes.
8. **Checksum Hash Functions:**
   * Primarily used for error checking in data transmission or storage.
   * Example: CRC (Cyclic Redundancy Check).
9. **Linear Probing and Quadratic Probing:**
   * Not exactly standalone hash functions but collision resolution techniques used in hash tables.
   * Linear Probing: Resolving collisions by checking the next entry in the table.
   * Quadratic Probing: Resolving collisions by using a quadratic function to probe for an empty slot.

Each type of hashing function has its own advantages and use cases. The selection of a particular hashing function depends on the requirements of the specific application, including considerations like efficiency, collision handling, security, etc.