**1. Hashing**

Hashing is a technique used in data structures to store and retrieve data efficiently. In hashing, a data value is converted into a smaller value using a special function called a hash function. This smaller value is used as an index to store data in a table called a hash table. Hashing allows fast access to data because it reduces the time needed to search for an element. Instead of searching through all elements, hashing directly finds the location of data.

**2. Significance of Hashing in Data Structure**

Hashing is significant because it provides very fast data access. It reduces searching time and improves performance. Hashing is widely used in databases, symbol tables, password storage, and indexing. It helps in handling large amounts of data efficiently. Hashing also supports quick insertion and deletion operations, making it very useful in real-time applications.

**3. Hash Function**

A hash function is a mathematical function that converts a given key into a fixed-size value called a hash value. This hash value is used as an index in the hash table. A good hash function distributes keys uniformly to avoid collisions. For example, if the key is 123 and the table size is 10, the hash value can be obtained using the function h(k) = k mod 10, which gives 3.

**4. Mid Square Method**

The mid square method is a hashing technique in which the key is first squared and then a few digits from the middle of the result are selected as the hash value. This method reduces clustering and provides better distribution of keys. For example, if the key is 45, squaring it gives 2025. Taking the middle two digits gives 02, which can be used as the hash value.

**5. Difference Between Division Method and Multiplication Method**

In the division method, the hash value is obtained by dividing the key by the table size and taking the remainder. In the multiplication method, the key is multiplied by a constant fraction and the fractional part is used to compute the hash value. The division method is simple and fast, while the multiplication method provides better distribution and reduces collisions. Both methods are used based on application requirements.

**6. Linear Probing and Data Bucket**

Linear probing is a collision resolution technique used in hashing. When a collision occurs, linear probing searches for the next available slot in the hash table sequentially. A data bucket is a storage unit in a hash table that can store one or more records. Buckets help manage collisions by allowing multiple elements to be stored in the same index.