

Name: Adwait Purao

Uid: 2021300101 Batch: B2 / B

Rabin-Karp algorithm is an efficient string matching algorithm that uses a hash function to compare patterns within text. It avoids comparing every character in the initial phase and instead filters out the characters that do not match. This algorithm is widely used for searching patterns in large texts, as well as for pattern matching in general.

However, Rabin-Karp algorithm has limitations, such as the possibility of spurious hits, where a window of text has the same hash value as the pattern, but is not the actual pattern. To address this, the algorithm uses modulus to reduce the number of spurious hits.

The worst-case complexity of Rabin-Karp algorithm occurs when spurious hits occur for all windows, resulting in a time complexity of  $O(mn)$ . However, on average and in the best case, its time complexity is  $O(m + n)$ .

Overall, Rabin-Karp algorithm is a useful tool for a variety of applications, including searching for strings in large texts and pattern matching.