**HASHING & HASH TABLES (20%)**

1. Explain what is a hashtable, hash function, and collision! (.pdf)
2. Explain 2 methods for collision handling and simulate the process in a graphical view! (.pdf, .png)

Answer:

1. Hashtable is similar to array, but accelerate the searching process as we have hashing function and have the key to search (similar to binary and linear search concept). Hash table is where we store the original data (string, int), where the index is the hashed data (string, int) and the value is the original data (string, int). For instance, we want to search a name with the first character of the name (let’s consider that names in hash tables is unique). From the hashing function (for example, our hashing function generate the index of the name we want to search with (string[0] – ‘a’) % 26), we’ll get the index, which is hashed string. So here, actually the hashed string (index) will represent the original string that we want to search.

Hash function is to hash the data to get the key / index to search the data we want to search.

Collision is the case when the a first character of a string will be stored to the hash table index where the string has the same first character. It also can be happened when the hash table is already full.