- Suppose a file of records contains names, social security numbers and much additional information.
- Sorting the file alphabetically and using a binary search is very efficient way to find the record for a given name.
- On the other hand, suppose we are given only the social security number of the person. Then we have to do a linear search for the record, which is extremely time-consuming for a very large number of records.
- How can we solve such a problem?
- One way is to have another file which is sorted numerically according to social security number. This would double the space required for storing the data.
- Another way is to have the main file sorted numerically by social security number and to have an auxiliary array with only two columns, the first column containing an alphabetized list of the names and the second column containing pointers which give the locations of the corresponding records in the main file.

5. Abstract Data Type:

- A set of data values and associated operations that are precisely specified independent of any particular implementation. It is also known as ADT.
- Common examples of abstract data types are the built-in primitive types in C is, Integer and Float.
- In general, there are many possible operations that could be defined for each ADT; however, they often fall into these categories: (initialize, add data, access data, remove data).
  - An abstract stack could be defined by two operations: PUSH (inserts some data item onto the stack), POP (extracts top item from it). Implement may be as array or linked list.
- Most Object Oriented Languages provide the feature of user-defined abstract data types. In C++ it can be done with a class.