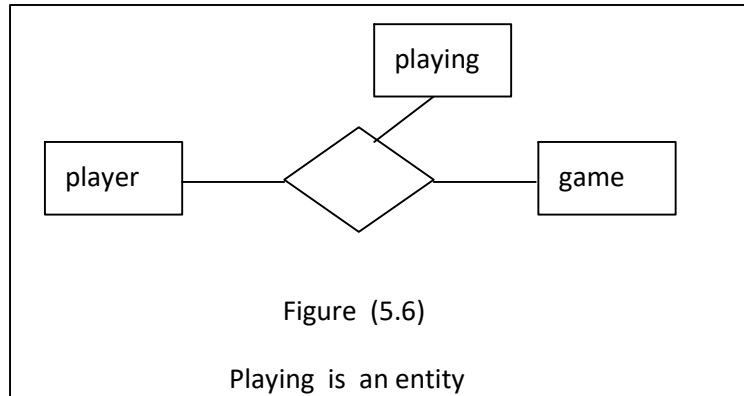


Playing can be an entity rather than an relation. In this case there will be only one existence of the playing information , and the player and the games is connected with the playing by keys as shown in figure (5.6)



6 Indexing and Hashing

Many queries reference only a small proportion of the records in a file. For example, the queries “Find all accounts at the Tech branch” reference only a fraction of the account records. It is inefficient for the system to have to read every record and to check the branch names. The system should be able to locate these records directly. To allow that, we design additional structures with the files.

An index for a file in the system works like a catalog for a book in a library, if we are looking for a book, the catalog of the name of the books tells us where to find the book.

To assist us searching the catalog, the names in the catalog listed in an alphabetic order.

There are two basic kinds of indices :

- Ordered indices: such indices are based on a sorted ordering of the values.
- Hash index : such indices are based on some values, these values calculated by a function called hash function.

We often want to have more than one index for the file. Return to the example of the library, there can be a catalog for the names of the books and another catalog for the others of the books and third one for the subjects of the books.

6.1 Ordered Indices :

These are used to gain fast random access to records in a file. Each index structure is associated with a particular **search key**. The index stores the values of the search keys in sorted order.