## Modern Education Society's Wadia College of Engineering, Pune

## 210256: DATA STRUCTURES and ALGORITHM LABORATORY (2019 C0URSE)

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| **NAME OF STUDENT:** | **CLASS:** |
| **SEMESTER/YEAR:** | **ROLL NO:** |
| **DATE OF PERFORMANCE:** | **DATE OF SUBMISSION:** |
| **EXAMINED BY:** | **EXPERIMENT NO: F23** |

**TITLE: Create sequential file and maintain data as specified**

**AIM/PROBLEM STATEMENT:** Department maintains a student information. The file contains roll number, name, division, and address. Allow user to add delete information of student. Display information of particular student. If record of student does not exist an appropriate message is displayed. If it is, then the system displays the student details. Use sequential file to maintain the data.

**OBJECTIVES:**

1. To understand file handling.
2. To understand working of sequential file.

**OUTCOMES:**

1. To apply appropriate file handling techniques on given data
2. To use sequential file.

**PRE-REQUISITE:**

1. Knowledge of C++ programming
2. Basic knowledge of sequential file

**THEORY:**

File is a collection of records related to each other. The file size is limited by the size of memory and storage medium.

**There are two important features of file:**

1. **File Activity:** File activity specifies percent of actual records which proceed in a single run.

2. **File Volatility:** File volatility addresses the properties of record changes. It helps to increase the efficiency of disk design than tape.

**File Organization**

File organization ensures that records are available for processing. It is used to determine an efficient file organization for each base relation.

**Types of File Organization-**

1. Sequential access file organization
2. Indexed sequential access file organization
3. Direct access file organization

1. **Sequential access file organization**

- Storing and sorting in contiguous block within files on tape or disk is called as **sequen tial access file organization**.
- In sequential access file organization, all records are stored in a sequential order. The records are arranged in the ascending or descending order of a key field.
- Sequential file search starts from the beginning of the file and the records can be added at the end of the file.
- In sequential file, it is not possible to add a record in the middle of the file without rewriting the file.

**This method can be implemented in two ways:**

**Pile File Method:**

- It is a quite simple method. In this method, we store the record in a sequence, i.e., one after another. Here, the record will be inserted in the order in which they are inserted into tables.
- In case of updating or deleting of any record, the record will be searched in the memory blocks. When it is found, then it will be marked for deleting, and the new record is inserted.

**Sorted File Method:**

- In this method, the new record is always inserted at the file's end, and then it will sort the sequence in ascending or descending order. Sorting of records is based on any primary key or any other key.
- In the case of modification of any record, it will update the record and then sort the file, and lastly, the updated record is placed in the right place.

**2. Direct access file organization**

- Direct access file is also known as random access or relative file organization.
- In direct access file, all records are stored in direct access storage device (DASD), such as hard disk. The records are randomly placed throughout the file.
- The records does not need to be in sequence because they are updated directly and rewritten back in the same location.
- This file organization is useful for immediate access to large amount of information. It is used in accessing large databases.
- It is also called as hashing.

**3. Indexed sequential access file organization**

- Indexed sequential access file combines both sequential file and direct access file orga nization.
- In indexed sequential access file, records are stored randomly on a direct access device such as magnetic disk by a primary key.
- This file has multiple keys. These keys can be alphanumeric in which the records are ordered is called primary key.
- The data can be access either sequentially or randomly using the index. The index is stored in a file and read into memory when the file is opened.

**Primitive Operations on Sequential files:**

• **Open**—This opens the file and sets the file pointer to immediately before the first record

• **Read-next**—This returns the next record to the user. If no record is present, then EOF condition will be set.

• **Close**—This closes the file and terminates the access to the file.

• **Write-next**—File pointers are set to next of last record and write the record to the file.

• **EOF**—If EOF condition occurs, it returns true, otherwise it returns false.

• **Search**—Search for the record with a given key.

• **Update**—Current record is written at the same position with updated values.

**QUESTIONS:**

1. Explain direct sequential file.
2. Explain advantage and disadvantages of the sequential file
3. Explain advantages and disadvantages of direct access method.