RAMA UNIVERSITY
www.ramauniversity.ac.in

FACULTY OF ENGINEERING & TECHNOLOGY

BCS-501   Operating System

Lecturer-29

Manisha Verma
Assistant Professor
Computer Science & Engineering

➢**File Operations**

➢**Open Files**

➢**Open File Locking**

➢**File Locking Example**
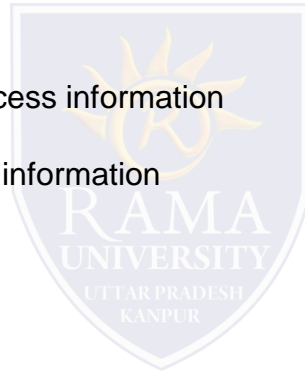
File Operations

File is an abstract data type---

• Create

• Write – at write pointer location

• Read – at read pointer location

• Reposition within file – seek

• Delete

• Truncate

• *Open(F_i)* – search the directory structure on disk for entry F_i, and move the content of entry to memory

• *Close (F_i)* – move the content of entry F_i in memory to directory structure on disk
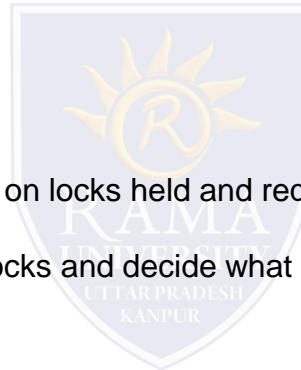
Open Files

- Several pieces of data are needed to manage open files:

  - **Open-file table**: tracks open files

  - File pointer: pointer to last read/write location, per process that has the file open

  - **File-open count**: counter of number of times a file is open – to allow removal of data from open-file table

  - when last processes closes it

  - Disk location of the file: cache of data access information

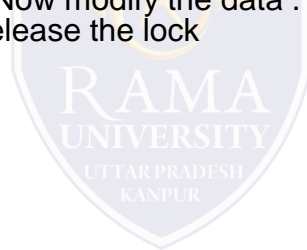 - Access rights: per-process access mode information

Open File Locking

- Provided by some operating systems and file systems

  - Similar to reader-writer locks

  - Shared lock similar to reader lock – several processes can acquire concurrently

  - Exclusive lock similar to writer lock

- Mediates access to a file

- Mandatory or advisory:

  - Mandatory – access is denied depending on locks held and requested

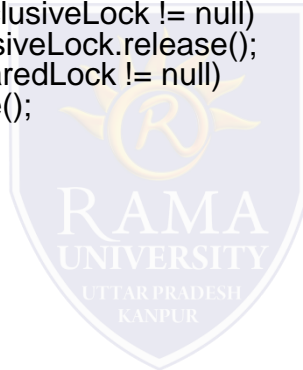 - Advisory – processes can find status of locks and decide what to do

```
•import java.io.*;
import java.nio.channels.*;
public class LockingExample {
            public static final boolean EXCLUSIVE = false;
            public static final boolean SHARED = true;
            public static void main(String arsg[]) throws IOException {
                        FileLock sharedLock = null;
                        FileLock exclusiveLock = null;
                        try {

                                    RandomAccessFile raf = new RandomAccessFile("file.txt", "rw");
                                    // get the channel for the file
                                    // this locks the first half of the file - exclusive
                                    exclusiveLock = ch.lock(0, raf.length()/2, EXCLUSIVE);
                                    /** Now modify the data . . . */
                                    // release the lock

            exclusiveLock.release();
```

```java
        // this locks the second half of the file - shared
                        sharedLock = ch.lock(raf.length()/2+1, raf.length(),
                        SHARED);
                        /** Now read the data . . . */
                // release the lock
                        sharedLock.release();
                } catch (java.io.IOException ioe) {
                        System.err.println(ioe);
                }finally {

                        if (exclusiveLock != null)
                        exclusiveLock.release();
                        if (sharedLock != null)
                sharedLock.release();
                }
        }
}
```

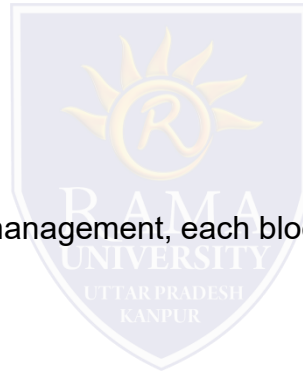Airline reservation systems and inventory control system are the examples of ……………………. system.
A) pile
B) sequential file
C) indexed sequential file
D) indexed file

The ………………… greatly reduced the time required to access a single record, without sacrificing the sequential nature of the file.
A) pile
B) sequential file
C) indexed sequential file
D) indexed file

In …………………….. method on free space management, each block is assigned in a reserved portion of the disk.
A) Bit tables
B) Chained Free Portions
C) Indexing
D) Free Block List

In …………………….. file organization, a fixed format is used for records where all records are of the same length, consisting of the same number of fixed length fields in a particular order.
A) pile
B) sequential
C) indexed sequential
D) indexed

In …………………….. method on free space management, each block is assigned in a reserved portion of the disk.
A) Bit tables
B) Chained Free Portions
C) Indexing
D) Free Block List