Assignment 8 – 3411 – File Systems

1. **List the 7 basic file attributes associated with a file in operating systems**

- Name
- Identifier
- Type
- Location
- Size
- Protection
- Timestamps and user identification

2. **List the 8 basic file operations (activities you can perform on a file).**

- Creating a file
- Opening a file
- Writing a file
- Reading a file
- Repositioning within a file
- Deleting a file
- Truncating a file
- Appending new information to the end of a file

3. **File type is used how by the operating system?**

- The operating system uses file type to determine whether the operating system should recognize and support a file. If it recognizes it, it can determine the function of the file type and operate on it in a reasonable way

4. **File type is used how by the application?**

- Applications use file types to determine which file types the are interested in. For example .com and .exe are two forms of binary executable files; whereas .sh is a shell script that contains commands to the operating system.

5. **Explain how a sequential file is different from a direct access file?**

- *Sequential file* is the simplest access method. Information in the file is processed in order, one record after another
- In a *direct access file,* the file is made up of fixed-length logical records that allow programs to read and write records rapidly in no particular order. There are no restrictions on the order of reading or writing for a direct access file. Databases are often this type as you can access large amounts of information immediately

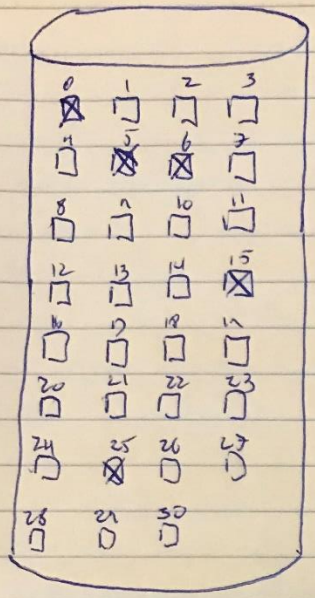
6. **Explain how direct access files allow for access to any item in the file?**

- Any item in the file will have a block number. When querying data you provide the block number to the file operations which will indicate which block contains the information that is being requested.

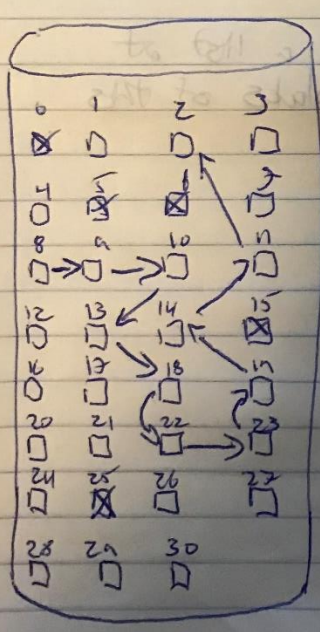
7. **List the basic operations required on a directory in file systems?**

- Search for a file
- Create a file
- Delete a file
- List a directory
- Rename a file
- Traverse the file system

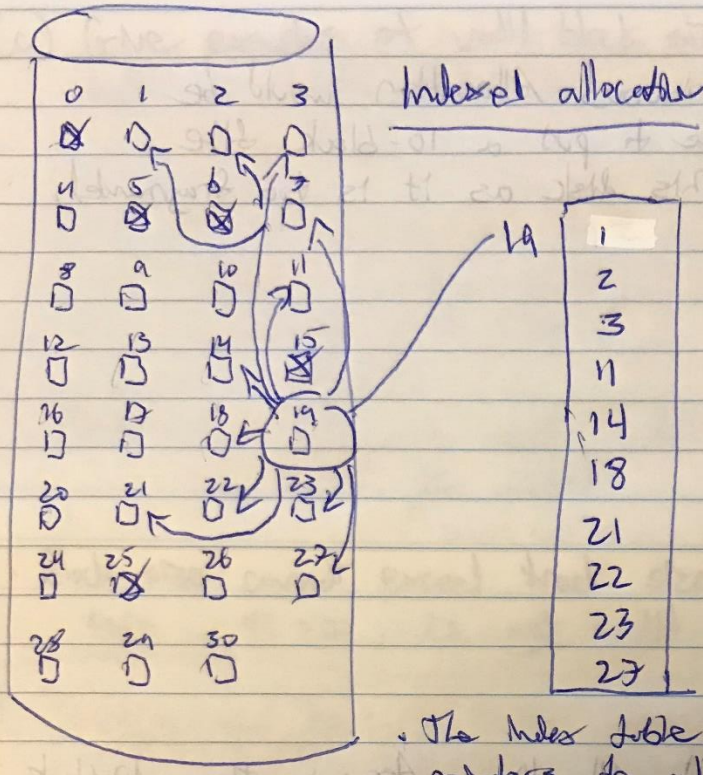
8. **We have discussed three file allocation techniques for storing a file on disk, namely contiguous allocation, linked allocation, and indexed allocation. For each allocation method show how a file of 10 blocks would be allocated on disk. Note that the disk is represented as 30 blocks with blocks 0, 5, 6, 15, 25 already allocated. Note you must show the entire data structure for each allocation method as part of the answer.**



- Continuous Allocation would be unable to put a 10-block file on this disk as it is too fragmented.



- Linked Allocation: Assuming the 10-block file starts at block 8, the arrows indicate the block pointer direction to travel to get each piece of the file in each block.



Indexed allocation

- The index table contains a list of pointers to all the blocks of the file.