Name: _____ USC ID: _____

Quiz 3: File Systems (10 points), 10 minutes

1. [2 points] Explain the input parameters and output of system call: int fd = open('foo.txt', O_RDONLY)

fd: a file descriptor (the smallest unused descriptor) if open successfully, otherwise return -1
'foo.txt': the pathname to the file.
O_RDONLY: oflag, the kind of access requested on the file, here is READ ONLY.

fd. the smallest unused descriptor!!!
'foo.txt'.
O_RDONLY: oflag. The kind of access requested on the file.
*reserved fds: stdin 0, stdout 1, stderr 2 ∴ start from 3 usually.

2. [2 points] Explain the input parameters and output of system call: int n = read(fd, buffer, size)

n: the number of bytes read (zero indicates end of file) and the file position is advanced by this number. Alternatively, -1 is returned when an error occurs.
fd: a file descriptor of the file.
buffer: the buffer where the read data is to be stored.
size: the number of bytes to be read from the file.

3. [2 points] Give at least two kinds of information stored in an inode.

Device ID.
File serial numbers.
The file mode which determines the file type and how the file's owner, its group, and others can access the file.
A link count telling how many hard links point to the inode.
The User ID of the file's owner.
The Group ID of the file.
The size of the file in bytes.
Timestamps telling when the inode itself was last modified (ctime, inode change time), the file content last modified (mtime, modification time), and last accessed (atime, access time).
The preferred I/O block size.
The number of blocks allocated to this file.

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① user ID of owner
② Group ID of the file
③ Timestamp of when the inode / file is modified, or last accessed

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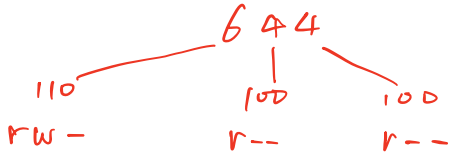
4. [2 points] Explain the meaning of file permission mode: 0644 (note that 0 means octal value).

   644 -> 110 (owner)100(group)100(others)->rw-r- -r- -



5. [2 points] Suppose the size of file “hello.txt” is 5KB. After executing “ln -s hello.txt abc.txt”, what is the size of “abc.txt”? Explain your answer.

   ln -s create a symbolic link, so the size of “abc.txt” is 9 Bytes, which is the length_of(hello.txt)*sizeof(char). No ‘\0’ is required here.