Name: _____   USC ID: _____

Quiz 3: File Systems (10 points), **10 minutes (morning section)**

State the steps for implementing the following system functions (executed in sequence). Be sure to indicate the file system objects (inode, bitmap, data block, etc.) or the file-open table each steps is operated on, and state any changes to the object or table.

1. [7 points] int fd = open("/foo/more/bar.txt", O_**WRONLY**)

Data bitmap	Inode bitmap	Root inode	Foo inode	more inode	Bar inode	Root data	Foo data	More data
		read						
						Read		
			read					
							Read	
				read				
								Read
	read							
	write							
					write			
								write
			Write					

Read '/' inode & content obtain foo's inumber (create entry of its inumber in the file-open table)
Read'/foo' inode & content obtain more's inumber (create entry of its inumber in the file-open table)
Read '/more' node & content, check if bar.txt exists (create entry of its inumber in the file-open table)
Read imap to find a free inode for bar.txt
Update imap, setting 1 for allocated inode
Write bar's inode
Update more's content adding an entry for bar
Update more's inode Update its modification time
Update foo's inode Update its modification time

2. [3 points] int ret_in = write(fd, buffer, 4096)

Data bitmap	Inode bitmap	Root inode	Foo inode	more inode	Bar inode	Root data	Foo data	More data	Bar data[0]	Bar data[1]
					read					
read										
write										
									write	
					write					

Read inode of bar (by looking up its inumber in the file-open table)
Allocate new data block, read and write bmap
Write to data block of bar
Update bar inode - new modified time, add pointer to block