Name: ______________________________ USC ID: ________________________

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

State the steps for implementing the following system functions (executed in sequence). Be sure to indicate the file system objects (inodes, bitmaps, data block, etc) each step is operated on and any changes made on the object; also indicate if the step uses/updates the file-open table and how. Assume the size of the file to be opened is **5k**. For q2 and q3, also state the value of ret_in when the functions successfully return.

1. [5 points] int fd = open("/foo/more/bar.txt", O_**RDONLY**)

   a. read inode and content of 'root' to look for inumber of 'foo' (2 reads)
   b. read inode and content of 'foo' to look for inumber of 'more' (2 reads)
   c. read inode and content of 'more' to look for inumber of 'bar.txt' (2 reads)
   d. read inode of 'bar.txt' to do a permissions check (1 read)
   e. allocate file descriptor, update file-open table and return the file descriptor to the user

   ***every step is worth 1 point.*

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

   a. look up inumber of 'bar.txt' from the file-open table via file descriptor
   b. consult inode of 'bar.txt' to find the location of the first data block
   c. read the block and update newest file access time
   d. update open-file table with new offset

   current offset = 4096
   ret_in will be 4096

   ***every step is worth 0.5 point.*
   ***ret_in value is worth 1 point.*

3. [2 points] int ret_in = read(fd, buffer, 2048)

   a. get the current offset of 'bar.txt' from the file-open table via file descriptor
   b. consult inode of 'bar.txt' to locate the next chunk
   c. read the block, update newest file access time
   d. update open-file table with new offset

   current offset = 5120
   ret_in will be 1024

   ***lose 0.5 points for every 2 steps.*
   ***ret_in value is worth 1 point.*

If same flaws in both question 2 and question 3, no double deduction but mainly using rubric of question 2.