

## In-Class Problems: File Systems

Consider the following fragment of an application that accesses a file stored in a VSFS-like file system:

```
char x[1000];  
// assume that f is a descriptor referring to a  
// large file that has already been opened  
lseek(f,10500,SEEK_SET);  
write(f,x,1000);  
read(f,x,1000);
```

Assume that the file system uses a block size of 1024 bytes, and that i-nodes include 9 direct pointers, 1 indirect pointer, and one double-indirect pointer. The file system has a block cache (initially empty) and an i-node cache.

Estimate the number of read and write operations the file system will need to perform to implement each of the file system operations in the application program.