1. **MacOS saves the name of the parent program when creating a file**
   1. *Advantages:* Automatic program invocation and launch
   2. *Disadvantages:* Requires more OS overhead and requires additional space in the file description
2. **App only accesses data sequentially**
   1. The operating system can take advantage of this by ‘preloading’ the subsequent blocks of memory reducing the access and load time.
3. **Assume that a file system uses i-nodes to represent files. Disk blocks are 8-KB in size and a pointer to a disk block requires 4 bytes. This file system has 12 direct disk blocks, plus single, double, and triple indirect disk blocks. What is the maximum size of a file that can be stored in this file system?**
   1. (12 \* 8 KB) + (2048 \* 8 KB) + (2048 \* 2048 \* 8 KB) + (2048 \* 2048 \* 2048 \* 8 KB) = 64 terabytes
4. **A file system on an external hard disk has both logical and physical block sizes of 512 bytes. The directory information about each file is already in memory. Answer the following questions for each of three allocation strategies - contiguous, linked, and indexed:**
   1. **How is the logical-to-physical address mapping accomplished in this system? (For the indexed allocation, assume that a file is always less than 512 blocks long.)**
   2. **If we are currently at logical block 10 (the last block accessed was block 10) and want to access logical block 4, how many physical blocks must be read from the disk?**
      1. *Contiguous:* Z is the starting file address. Divide the logical address by 512, with X being the integer result and Y is the remainder. X+Z with return the physical block number and Y is the displacement. This method requires reading 1 block.
      2. *Linked:* Z is the starting file address. Divide the logical address by 512, with X being the integer result and Y is the remainder. Follow the linked list, the result is X+1 blocks. Y+1 is the displacement into the last block. This method requires reading 4 blocks.
      3. *Indexed:* Z is the starting file address. Divide the logical address by 512, with X being the integer result and Y is the remainder. Move the indexed block into memory, the physical memory location is at location X within the block. Y is the displacement into the block. This method requires reading 2 blocks.
5. **Assume that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithms**
   1. **FCFS- First Come First Serve**
      1. 143, 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130
      2. Total distance moved: 7081
   2. **SSTF- Shortest Seek Time First**
      1. 143, 130, 86, 913, 948, 1022, 1470, 1509, 1750, 1774
      2. Total distance moved: 1745
   3. **SCAN- Elevator**
      1. 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 4999, 130, 86
      2. Total distance moved: 1745
   4. **LOOK**
      1. 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 130, 86
      2. Total distance moved: 3319
   5. **C-SCAN- Circular Scan**
      1. 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 4999, 0, 86, 130
      2. Total distance moved: 9985
   6. **C-LOOK**
      1. 143, 913, 948, 1022, 1470, 1509, 1750, 1774, 86, 130
      2. Total distance moved: 3363