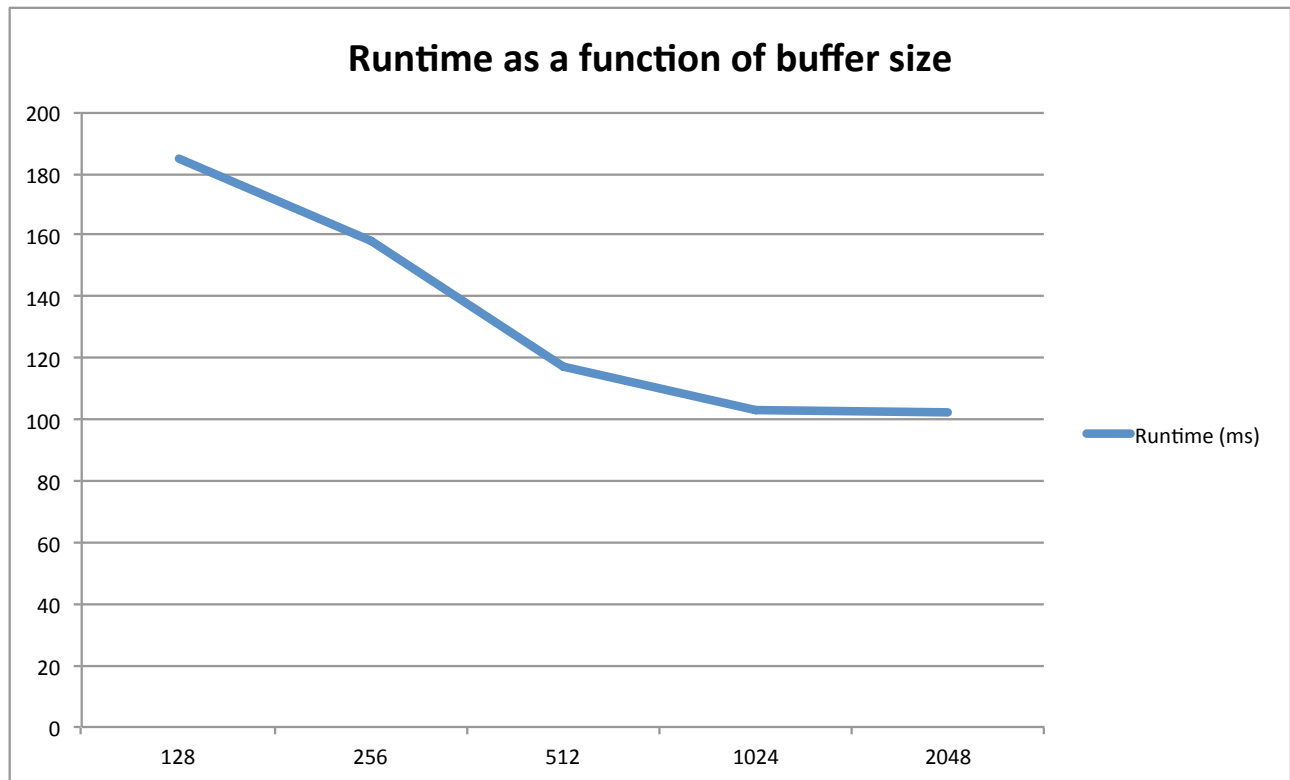


Operating Systems - Ex. 1

Part 2:

1.



2.

Reading and writing to the disk requires system calls, which take a lot of time (relatively). Therefore, by increasing the buffer size, the program requires less system calls, which shortens the time required to execute the program.

(higher buffer size → less system calls → shorter runtime)

3.

Printing out a character would require another system call. Because this is a costly action (time-wise), doing so this many times (between 2400 and 39,000 times, depending on buffer size) would significantly increase the runtime of the program.

Part 3:

1.



False. In order to access the screen, a program must use a system call to request so from the operating system's kernel.

2. **False.** A system call is sent from an application/program. Pressing a key on the keyboard will send an interrupt.
3. **False.** An Interrupt is a signal sent **to** the CPU **from** external devices (or some programs).
4. **False.** Programs in user mode such as a web browser routinely send system calls for various purposes, such as printing out information on the computer's screen.
5. **False.** Not all default programs run in kernel mode. For example, Window's Explorer web browser runs in user mode.
6. **True.** The operating system will do this in order to perform some actions without being interrupted. After completing these actions interrupts will once again be unblocked.
7. **False.** Running a program on a Virtual Machine instead of the native system will cause that program to run slower. This is because you're actually putting additional layers between the program and the CPU, thus making many action slower.
8. **False.** Like printing onto a screen, a program running in user mode can use a system call to perform action involving the CD-ROM.
9. **False.** System calls usually cause the program to run slower. Performing the same action with fewer system calls will result in a faster program.
10. **False.** External devices do not use system calls.