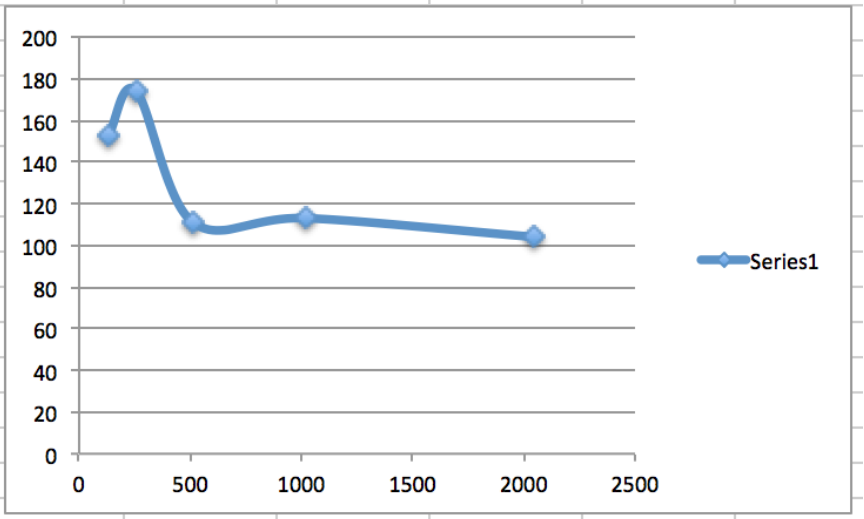
OS Ex01
Amir Abramovitch
200336626

Part 2

1.

bufferSize (bytes)	Time (ms)
128	153
256	174
512	111
1024	113
2048	104



2. Reading and writing to the disk uses system calls, which takes time. The more system calls you use, the longer your program will take to run. When reading the file in small chunks, a lot of system calls are being used. When reading the file in larger chunks, less system calls are used. This is why the time changes with different buffer sizes, and is not a straight line.

3. Printing stars each time the buffer is reloaded should not change the running time drastically, as computers today are very fast and can print out stars in no time. It should, however, take just a little bit longer to finish, as printing to the screen is another system call, and so you effectively double the number of system calls each time you fill the buffer (read from disk AND print a star), so you do add some time to the overall run.

Part 3

1. **False** - Printing to the screen uses a system call.
2. **False** - a system call is how a program request a service from the OS. Since a keyboard is not a program, it does not issue system calls.
3. **False** - Interrupts, or more specifically hardware interrupts, are signals sent TO the CPU from external devices, and not the other way around.
4. **False** - System calls were meant to be invoked EXACTLY BY user-mode programs, so of course they are allowed to do so.
5. **False** - Not every program that comes with the OS is ran in kernel-mode. Take minesweeper for example. Also, not every program that the user installs runs in user-mode. Take the anti-virus driver for example.
6. **False** - The OS can only disable some interrupts (e.g. maskable interrupts), not ALL interrupts.
7. **False** - Running code in a VM causes extra overhead, since another layer of abstraction is used. Therefore it will usually run slower.
8. **False** - Only privileged programs should run in kernel-mode. The music player should run in user-mode, and use system calls to access the CD-ROM.
9. **False** - Exactly the opposite. Using system calls causes context switches, which takes time, and ultimately causes the program to run slower.
10. **False** - External devices communicate with the operating system using interrupts, not system calls.