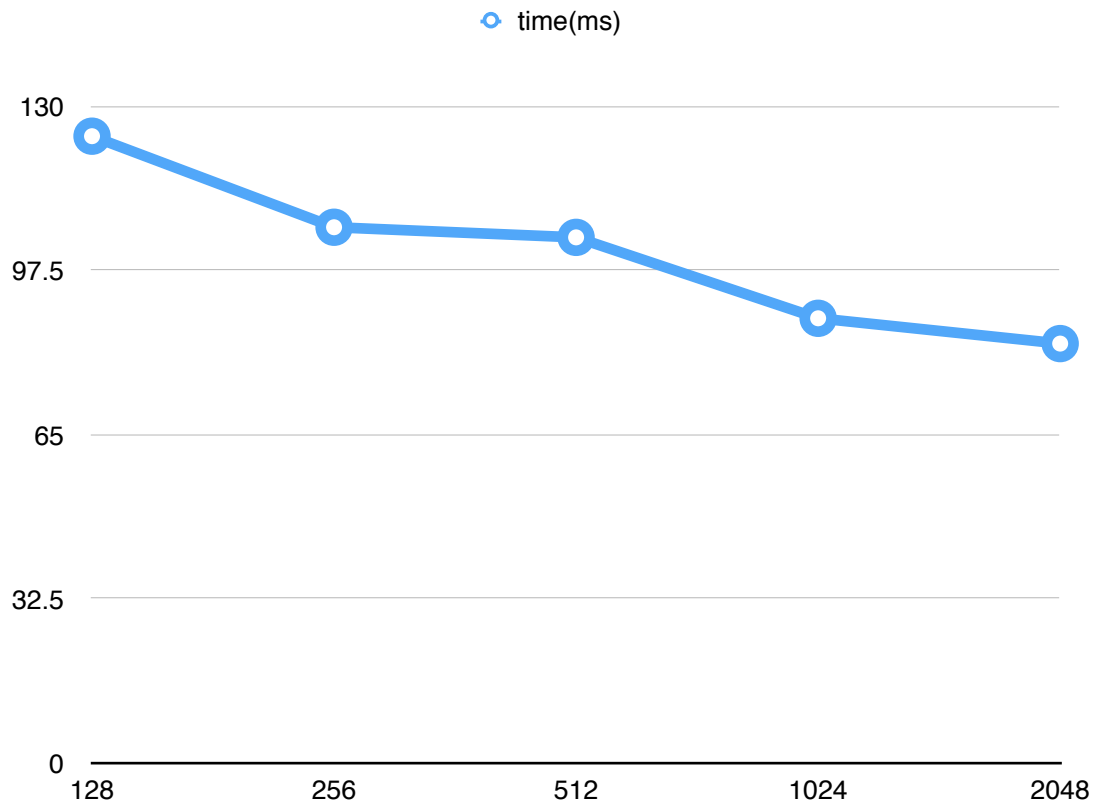


Part 2:



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2. Why isn't it a straight line, parallel to the X axis?

When we use a small buffer we will need to make more system calls (every IO read/write operation). System calls are expensive (in time) operations that makes our project to run slower.

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3. Hypothetically, if we change the TimeTest in part 1 to print out to the screen a '\*' character each time the buffer is 'reloaded', will the running time change significantly?

Yes, every print of '\*' will cause a system call, it's an IO operation . The time it take will be significantly slower.

Part 3:

1. A simple program which prints "Hello World!" to the screen does not need to use any system calls.  
**False** it's prints text to the screen, it should use system call for that.
2. Pressing a key on the keyboard will cause a system call.  
**False** pressing a key on keyboard will cause an interrupt and not a system call.
3. Interrupts are signals sent from the CPU to external devices.  
**False** interrupts are signals sent from external devices to the CPU, in order to make something immediately
4. Applications such as a web browser (e.g. Chrome/Explorer) are running in user mode and therefore are not allowed to invoke system calls.  
**False** applications such as web browser are running in user mode but they can invoke system calls that requests a service from an operating system's kernel.
5. Every program that is a part of the operating system (i.e. installed with it), like the command interpreter (the shell) and the web browser, runs in kernel mode. Programs that the user installs, like Office, run in user mode.  
**False** the programs that come with OS are run in user mode as well as programs that the user installs.
6. The operating system may disable all interrupts, thus blocking all external devices from accessing the CPU.  
**True** CLI and STI are privileged instructions that can block all external devices to cause interrupts. It can happen only in kernel mode code.
7. If a user wants to improve the throughput of his program, he should run it on a virtual machine (VM) and therefore it will run faster.  
**False** running program on VM will make it slower, because there are more layers between the program and the CPU with VM (i.e. hypervisor ).
8. If a programmer wants to write an application that plays music from a CD-ROM, the program cannot be run it in user mode, as it must run in kernel mode to access the CD-ROM.  
**False** the program runs in user mode and will cause system call to kernel for accessing the CD-ROM
9. Usually, if a program uses more system calls it will run faster.  
**False**, the program will run slower due to all the context switching between user and kernel.
10. External devices may access the operating system by using System Calls.  
**True**, external devices can access the OS by using system calls that are handled in kernel mode.