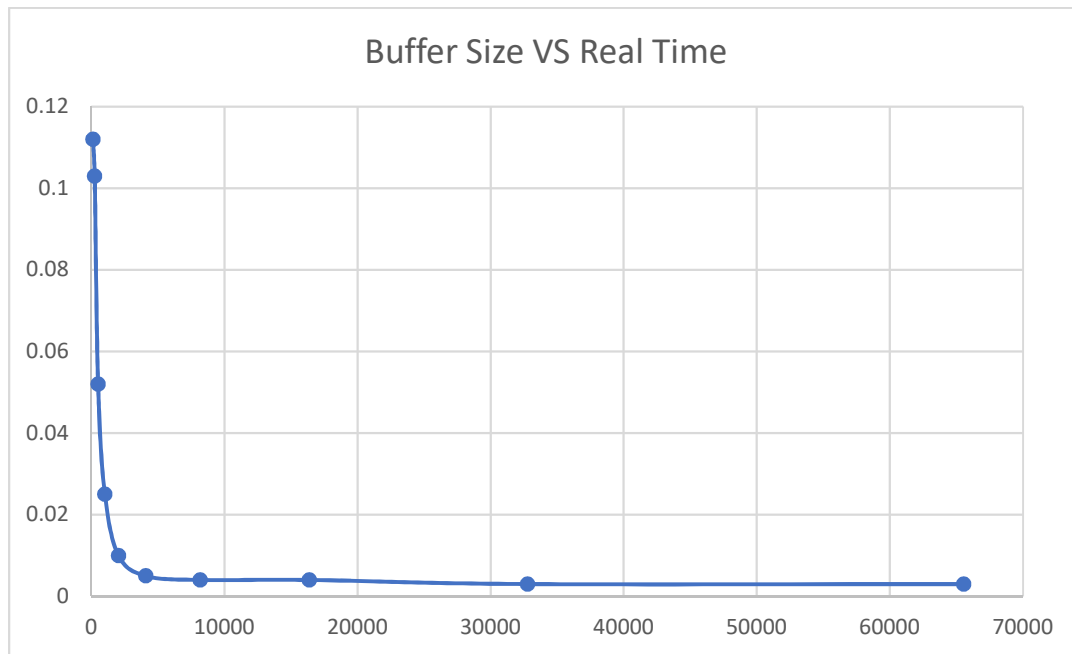


EX1 – Gai Ashkenazy – 204459127

Part 2:

3.



4. First notice that as the buffer gets larger we make less systems calls and the program runs faster.

Second, because we increase the buffer exponentially the system calls reduce exponentially, and therefore the time is reducing exponentially.

5. if we will add the running time will increase substantially.

If we will change the coping to printing, I think that the running time will increase quite a bit, because it is known that printing to the screen is a high cost operation.

But it will not be very significant because the number of system call, software interrupts, will still be the same.

Part 3:

1. Some instructions are not executable in user mode.

True, for example I/O instructions must be executed in kernel mode.

2. System calls are executed by the operating system and therefore their running time is faster.

False, operations that are only in user mode can be faster, because these two reasons first only the switch to and from kernel mode will take a long time, and second some system calls can take a long time, like printing many words to the screen.

3. The JVM let users to run the same Java code on different OS. One of the tasks of the JVM is to translate the Java code to the specific system calls of the operating system.

True, the JVM must translate the code on different OS's, so that it can execute I/O operations, File, Socket and other operations.

4. Notepad is a built-in OS(Windows) program which is used in order to write and read from files. Therefore, it is executed in Kernel mode.

False, Notepad is an application that runs in user mode, it will use system calls to any I/O operations, for example.

5. The following line will cause a transition from User mode to Kernel mode:

```
throw new RuntimeException();
```

False, calling the RuntimeException Object is done in user mode, this is a mechanism of preventing illegal data or unwanted to enter the CPU.

6. The following line will cause a transition from User mode to Kernel mode:

```
int a = 0;
```

```
int b = 5/a;
```

True, the division by 0 will trigger an exception, which comes from the kernel mode, hence there will be a switch.

7. An application can tell a specific hardware device to stop sending interrupts.

False, regular applications cannot disable interrupts.

Although it is possible to uninstall a driver, which means that it will no longer send interrupts.

8. Interrupts are sent to the process that currently running.

False, interrupt is a signal to the processor emitted by hardware or software indicating an event that needs immediate attention, an interrupt can start a process that is not running, for example getting a request to pair with a Bluetooth device.

9. A programmer can decide whether to run a program in Kernel mode or not.

False, the programmer can use only the user mode, he can transfer data to the kernel mode by system calls like any other application.

10. When clicking on the mouse button, while working on a virtual machine. Who will get an interrupt first? The guest OS or the host OS? (Answer guest or host).

Host, the VM is an application installed on the host OS and a mouse click is an I/O operation, like any other application the VM requests a system call to move the mouse, and like any other application the interrupt will come thru the Host OS.