CIS 452 02 – Assignment 12 – Gabe Baksa

<average_seek_time> + <average_latency> + <control_overhead> + <transfer_time>

transfer_time = <block_size> / <transfer_rate

1. **Calculate the time it takes (on average) to transfer a 4KB block on a 7200 RPM disk with a 5ms average seek time, 1Gb/sec transfer rate with a .1ms controller overhead (same example as in the book, please show your work)**

   5ms + 4.17ms + .1ms + <transfer_time>

   transfer_time = $\frac{4kb}{1Gb/s} * \frac{8Gb}{1\ GB} * \frac{1\ GB}{1024^2 KB} = \frac{32}{1024^2} s = .031\ ms$

   Average I/O time = 5ms + 4.17ms + .1ms + .031ms = 9.301 ms

2. **Calculate the time it takes (on average) to transfer a 8KB block on a 10,000 RPM disk with a 3ms average seek time, 1Gb/sec transfer rate with a .1ms controller overhead (please show your work):**

   3ms + 3ms + .1ms + <transfer_time>

   transfer_time = $\frac{8kb}{1Gb/s} * \frac{8Gb}{1\ GB} * \frac{1\ GB}{1024^2 KB} = \frac{64}{1024^2} s = .062\ ms$

   Average I/O time = 3ms + 3ms + .1ms + .062ms = 6.162 ms

3. **Calculate the time it takes (on average) to transfer a 64KB block on a 10,000 RPM disk with a 3ms average seek time, 1Gb/sec transfer rate with a .1ms controller overhead (please show your work):**

   3ms + 3ms + .1ms + <transfer_time>

   transfer_time = $\frac{64kb}{1Gb/s} * \frac{8Gb}{1\ GB} * \frac{1\ GB}{1024^2 KB} = \frac{512}{1024^2} s = .496\ ms$

   Average I/O time = 3ms + 3ms + .1ms + .496ms = 6.596 ms