

## CmpE130 Homework 2

Due date: 10 Sept. 2009

Examine the specifications for the Samsung **HD103UJ** found at [http://www.samsung.com/global/business/hdd/productmodel.do?group=&type=61&subtype=63&model\\_cd=249&dType=G&mType=UM&tab=down&ppmi=1155#](http://www.samsung.com/global/business/hdd/productmodel.do?group=&type=61&subtype=63&model_cd=249&dType=G&mType=UM&tab=down&ppmi=1155#) (click on the “specifications” tab).

1. Use the *Data Transfer Rate / Media to/from Buffer(Max.)* specification to calculate the maximum number of sectors per track.
2. Use an average value for sectors per track of 75% of the maximum to estimate the total number of cylinders. (Note from the picture at the top that there appear to be four platters.)
3. Using the manufacturer's specified average seek time and latency, and assuming the average value for sectors per track, estimate the time required to write a file of size 960 megabytes (1 MB =  $2^{20}$  B), stored in clusters of 16 sectors, located randomly on the disk.
4. Repeat the previous calculation, assuming that the file is stored in adjacent cylinders.

Note the proposal to provide new binary prefixes that would alleviate the confusion caused by having two different ways of calculating “gigabytes” ( $10^9$  or  $2^{30}$ ):

[http://en.wikipedia.org/wiki/Binary\\_prefix#IEC\\_standard\\_prefixes](http://en.wikipedia.org/wiki/Binary_prefix#IEC_standard_prefixes) .