CSE 102 **Assignment: due in class**
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1. A disk drive contains s sectors per track; after the head is positioned on the proper cylinder, show the expected number of sectors to pass under the head before the desired sector is approximately $s/2$. State your assumptions.

2. A disk drive contains c cylinders; show the expected number of cylinders traversed to respond to a "random" request is approximately $c/3$. State your assumptions.

   Please do one of the next two problems.

3. A disk drive manufacturer claims their disk drive has 4.9ms average seek time. We detect the following parameters for the disk drive; there are 13,232 cylinders on this variety of drive, the minimum seek time is 1.1ms and the maximum seek time is 9.8ms; finally, we also know the transition between a short and long seek occurs at 2640 cylinders. Determine the seek-time model parameters a, b, c, d similar to those specified on page VII of the first lecture.

4. In this exercise, we are to calculate the expected seek time for an IBM 18LZX drive taking into account the zone information specified within the file cs102/public together with the seek timing model given on page VII of the first lecture. You should assume that all sectors are equally likely to be accessed "next." How does this compare with the IBM's claimed 4.9ms average seek time?

   A disk drive has the following performance characteristics: 10000 rpm rotation speed and each track contains two hundred fifty 512 byte sectors. The average seek latency is 4.9ms; the minimum and maximum are 1.1ms and 10.2ms respectively. For these exercises, a stripe unit consists of 8KB.

5. What is the read and write service times T_S for a single stripe unit?

   The following problems continue the above in which each operation accesses a total of 1 MB of "contiguous" data.

6. What is the read and write service times T_S for a 1 MB "contiguous" data operation?

7. Plot response time T_R curves for the four operations above; you are to assume the usual M/M/1 model for the disk drive operation queue. One graph containing all four curves will suffice.